POTTERTON COMMERCIAL

INSTALLATION MANUAL

EUROCONDENSE **Plus**
(with BMU 64... > SW 2.08)

General Safety Precautions

Installation of System:

Important: The boiler must be commissioned following completion of installation. Operation of an uncommissioned appliance may cause injury to personnel and damage to the boiler/burner unit and could invalidate the manufactures warranties.
Commissioning must only be carried out by personnel approved and competent to do so. This facility is available from Potterton Commercial Service Offices.
Important: The boiler/burner unit is supplied in accordance with Potterton commercial quality assurance plan registered to meet the requirements of BSN ISO 9002. A condition of the supply of the appliance for compliance with this is the return of the appliance commisioning report.

Electrical installation

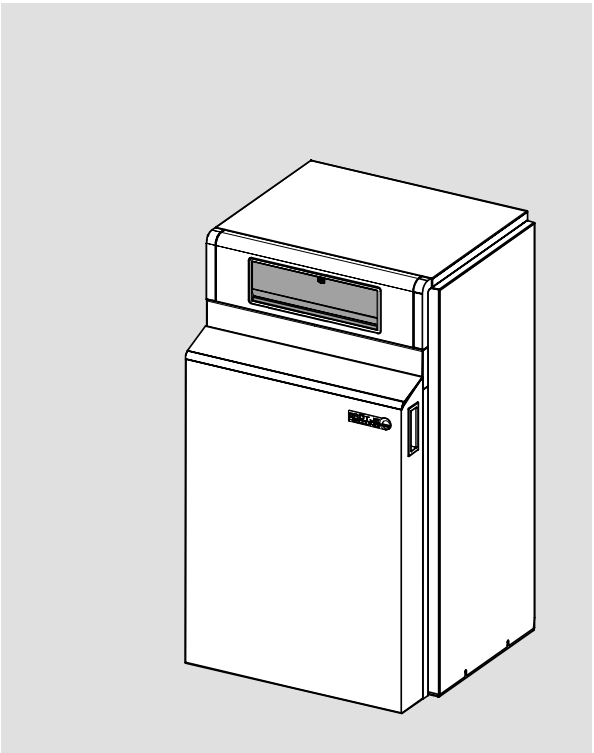
The work must be carried out by a qualified Electrician.

Gas connection:

Gas connection as well as commissioning, servicing and maintenance must be carried out by an approved Gas Installer (Corgi Registered). For use with natural Gas (G20) only Gas supply pressure 20 mbar (LPG options available).

Important notes:

Important notes for installation, operation, adjustment and service are indicated by this symbol.



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General

The Potterton EUROCONDENSE Plus condensing sectional boiler is available in five sizes with outputs at 60 °C return temperature from 86.7 kW to 237 kW. Table 11 give kW outputs and technical data for each model. They are CE marked for use on Natural Gas on open vented systems and they are suitable for use on sealed systems with a maximum operating pressure of 4 bar (58.8 p.s.i.) Refer to relevant British Standards and Codes of Practice installation of condensing boilers on sealed system.
The heat exchanger consists of an aluminium - silicon alloy which gives a very compact and lightweight boiler construction with corrosion resistance and high efficiency.
The fully pre-mixed burner works in a modulating range of between 35 % and 100 %. Therefore the boiler output is adapted to the particular heat requirements of the circuit. The gas / air ratio control ensures uniformly high CO_2 emissions and low NOX. This is obtained by comparing the target boiler temperature and the actual temperature from the sensor. If there is a difference between these two values then the internal microprocessor calculates a new fan speed. The change in fan speed in turn changes the combustion chamber static air pressure which is monitored by the gas / air ratio control and the gas rate is adjusted thus maintaining the correct gas to air ratio in the boiler. This ensures that a uniform gas / air ratio is maintained over the total range of the boiler modulation and that constant CO_2 values are achieved.
The gas train assembly, control panel and boiler case must be connected on site and apart from the incoming supply all other electrical connections are made by plug and sockets.
For high energy utilisation condensing boilers should be operated at a low return temperature. However the Eurocondense Plus will also work at designed temperatures of 70/50 °C in the condensing mode as the return temperature is under the dew point. (dew point is 53 °C at 8.5 % CO2).
Condensing boiler Series Eurocondense Plus are designed as hot water heating systems. They correspond to EN 676, EN 677 and Category I2H or II2H3P, for use in GB.

Corrosion protection

The combustion air must be free from corrosive elements - especially fluorine and chlorine containing vapours which are found for example in solvent and cleaning agents, propellant gases etc. When connecting boilers to under-floor heating systems employing plastic pipe work which is not impervious to oxygen, heat exchangers must be used for separation purposes.
Mains water of drinking quality without additives (chemical additives) must be used in the primary circuit of the boiler.

System Water quality

To ensure the boiler heat exchanger remains in good condition it is essential to condition and monitor the system water to the following criteria:
Water Hardness: If the system fill water has a hardness in excess of 250 mg/l (17.5° Clark) the water should be softened prior to filling the system to ensure that excessive scaling does not occur within the heat exchanger.
Water Acidity: The system fill water should have a pH value between 7 - 8.5 to ensure corrosion of the heat exchanger does not occur.
Copper Ions: The copper content of the system water should be less than 0.05 mg/l. If large quantities of copper are present red and black copper oxide Cu2O and CuO and, grey/green copper carbonate, CuCO2 will be produced. Copper will corrode any iron and aluminium within the system.
A specialist water treatment company should be consulted if in doubt.

Note: The only Inhibitors recommended by Potterton are FERNOX-COPAL or GRACE DEARBORN-SENTINEL X100

INSTALLATION / DIMENSIONS

Installation

Before starting work a risk assessment should be carried out in the boiler house and its access to ensure a safe installation and working environment. Any person installing or working on the boiler **must** be qualified and attention is drawn to the mandatory requirements of C.O.R.G.I. (ACOPS 16) registration for all Gas Intallers. Also they must be electrically competent an adhere to IEE regulations.
Manual Handling: Any person or persons moving or lifting the boiler or any part thereof should be trained in manual handling techniques and if necessary use suitable lifting equipement to reduce the risk of injury to themselves or other people.
The installation should comply with relevant British Standard Specifications, Codes of Practice and current Building Regulations, together with any special regional requirements of the Local Authorities, Gas Undertaking und Insurance Company. All electrical wiring must comply with I.E.E. Regulations for the Electrical Equipment of Buildings.
The installation of the boiler must be in accordance with the relevant requirements of:
Health & Safety at Work Act 1974.
Building Regulations 1991
Electricity at work Regulations 1989
Management of H&S at Work Regulations 1992
Manual Handling Regulations 1992
Model Water By-Laws 1986
BS 7671: 1992 – Requirements for Electrical Installations, IEE Wiring Regulations Sixteenth Edition.
BS 5440: 1990: Part 1 – Specifications for Installation of Flues
BS 5440: 1989: Part 2 – Specifications for Installation of Ventilation for Gas Appliances
BS 6644: 1991 – Installation of Gas Fired Hot Water Boilers for Inputs Between 60 kW and 2 MW
BS 7074: 1989: Part 2 – Application Selection & Installation of Expansion Vessels & Ancillary Equipment for Sealed Water Systems
BS 6880: 1988 – Codes of Practice for Low Temperature Hot Water Systems
EN 677: 1997 Gas-fired Central Heating Boilers for Condensing Boilers with a Nominal Heat Input not Exceeding 70 kW.
EN 676: 1996 Automatic Forced Draught Burners for Gaseous Fuels.
CIBSE AM3: Applications Manual for Condensing Boilers.
CP342:2 – Centralised Hot Water Supply
Gas Safety (Installation & Use) Regulations 1994
IM/11 Flues for Commercial and Industrial Gas Fired Boilers and Air Heaters.
IGE/UP/1 – Soundness Testing & Purging Procedure for Non-Domestic Installations
IGE/UP/2 – Gas Installation Pipework, Boosters & Compressors for Industrial & Commercial Premises.
Manufacturers notes must not be taken in any way as overriding statutory obligations

Ventilation

Safe, efficient and trouble free operation of conventionally flued boilers is vitally dependent on the provision of an adequate supply of fresh air to the room in which the appliance is installed. Account must also be taken of any other fuel burning appliance existing or to be fitted when designing the ventilation and combustion air systems.
The air supplied for boiler house ventilation shall be such that the maximum temperatures within the boiler house shall not exceed 25°C at floor level, 32°C at mid level (1.5m above floor level) and 40°C at ceiling level (or 100mm below ceiling level). Refer to BS 6644: 1991 for further details. BS 5440/989 Part 2.

Clearances

Special consideration must be given to the exhaust gas flue when selecting the position of the boiler. Sufficient space should be left at the front so that service work can be carried out.
The minimum boiler room clearance for access, erection and maintenance are as follows:-
REAR - 500 mm · SIDES - 300 mm · FRONT - 1000 mm · TOP - 500 mm

Fig. 1 Dimensions and connections

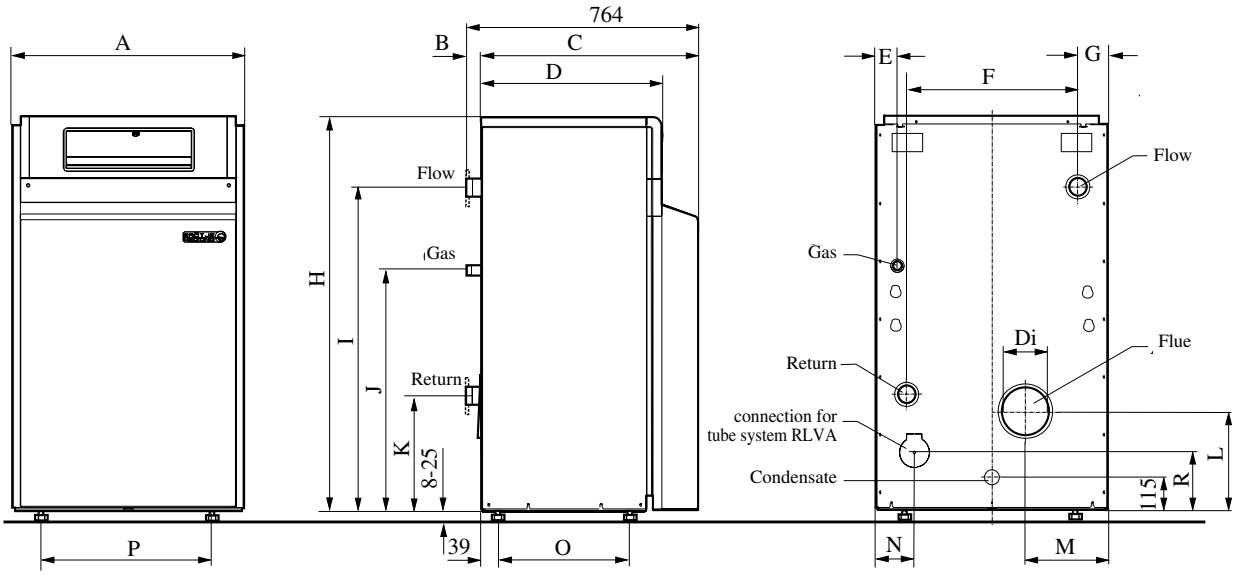


Table 1 Dimensions

Modell	Connections KV/KR	Gas
EC Plus 90	2 " BSP	1 " BSP
EC Plus 120		
EC Plus 160	2 1/2 " Flange	1 1/2 " BSP
EC Plus 200		
EC Plus 250		

Dimensions

Modell	Measurements in mm A	B	C	D	Di	E	F	G	H	I	J	K	L	M	N	O	P	R
EC Plus 90	762	50	715	597	152	82	579	98	1300	1065	795	382	328	271	673	466	537	130
EC Plus 120	910	50	715	597	152	82	689	107	1300	1065	795	382	328	290	821	466	647	190
EC Plus 160	1150	52	714	535	182	91	809	182	1390	1165	893	472	354	395	140	404	757	210
EC Plus 200	1150	52	714	535	182	91	919	127	1390	1165	893	472	354	340	140	404	867	210
EC Plus 250	1250	52	714	535	182	97	1029	122	1390	1165	893	472	354	335	305	404	977	170

GAS CONNECTION / ELECTRICAL CONNECTION

Boiler siting and base

A level non-combustible floor capable of supporting the weight of the boiler filled with water, see Table 11, together with any additional weight bearing down on the base from connections, etc. must be provided. This will typically be a 50mm concrete plinth with an area equal to that plan of the boiler.

It is not recommended to install commercial boilers in kitchens or living areas.

Gas supply

Where there is an existing primary gas meter, the appropriate gas supplier/undertaking must be consulted to ensure that the service/meter supply capacity is adequate for the proposed installation.
The burner gas connection sizes are given in Fig. 1.
The gas supply pipe should be sized to allow the minimum operating pressure to be available at the burner inlet under full running conditions.
The pipe should be sized to prevent excessive pressure drops under full running conditions.
Where gas boosters are required attention is drawn to the Gas Act 1986, Schedule 5, Part II, paragraph 8 (4). Guidance is given in IM/16 "Guidance Notes on the Installation of Gas Pipework, Boosters and Compressors in Customers Premises" published by British Gas Plc. The gas booster should be electrically interlocked to the burner.

Adjustment by the factory

The boiler is adjusted by the factory to a maximum nominal heat load and for use with natural gas (G20) or with LPG (G31). See boiler data badge for details.

Supply pressure

The supply pressure of natural gas must be between the following:
– Natural gas (G20): min 17.5 / max 25 mbar
– LPG (G31): min 42.5 / max 57.5 mbar
The supply pressure is measured on the gas valve inlet (see Fig 13).
If the supply pressures are outside this range, the boiler must not be put into operation. The gas utility company must be informed.

CO_2 content

When commissioning and during regular servicing of the boiler as well as after any conversion work on the boiler or the flue system, the CO_2 in the flue must be checked.

When running on natural gas, the CO_2 content must be between 8 % and 8.5%.

When running on LPG (propane), the CO_2 content must be between 9.5 and 10.0% (EC PLUS 90, 120)
9.0 and 9.5% (EC PLUS 160, 200, 250).

Too low CO_2 values may cause ignition problems. Too high CO_2 values can lead to incorrect combustion (high CO values) and damage to the burner. The CO_2 value is adjusted by setting the gas pressure on the gas valve (see Page 10–12). The air volume set at the factory must not be changed.

Table 2 Maximum Flue Lengths (in metres) for Systems including Fittings

Boiler Size	Nominal Flue Size mm	Number of fittings			
		1 Bend*	2 Bends*	3 Bends*	4 Bends*
90	150	42	42	42	42
120	150	45	45	45	45
160	180	50	50	46	46
200	180	50	50	46	46
250	180	50	50	46	46

* Bends: 90°

Flue connection

Typically a flue system must be constructed in 316 grade stainless steel with gasketed joints. Most flexible flue liners are unsuitable as they are not gas and water tight under positive pressure. Advice on flexible flue liners should be sought from a flue specialist.

Owing to the low flue gas temperature only single skinned flue pipe is necessary except in areas where personal protection is necessary (maximum temperature of 90 °C.)

The number of bends used should be kept to a minimum. Any bend used must be of the slow radius type, 90° tees must not be used.

All flue runs should be run to allow free drainage and all low points must be drained. Material for drainage should be stainless steel or plastic, avoid the use of copper.

Flue systems should meet the applicable sections of:-

BS 6644: 1991 or BS 5440 Part 1 & 2
British Gas publication IM11
CIBSE Applications Manual AM3 - Condensing Boilers
Third Edition of the 1956 Clean Air Act Memorandum

In addition to the above requirements of the Building Regulations should be strictly observed.

Care should be exercised with tall flue systems to ensure that excess buoyancy is not created. If this is unavoidable draught stabilisers should be considered plus a time delay device to prevent the boiler short cycling otherwise frequent nuisance lockouts may occur.

The boiler should be sited in accordance with BS 6644: 1991 with respect to protecting the boiler from damage, air for combustion and ventilation, discharge of products of combustion, clearances for service and access, temperatures, noise levels, the disposal of boiler water and the effects of flooding of the boiler house or seepage from a roof top boiler house. See section 1 for required boiler clearences for service and access.

CENTRAL HEATING CONNECTION / EXHAUST GAS CONNECTION

Boiler siting and base

A level non-combustible floor capable of supporting the weight of the boiler filled with water, see Table 9, together with any additional weight bearing down on the base from connections, etc. must be provided. This will typically be a 50mm concrete plinth with an area equal to that plan of the boiler.

It is not recommended to install commercial boilers in kitchens or living areas.

Gas supply

Where there is an existing primary gas meter, the appropriate gas supplier/undertaking must be consulted to ensure that the service/meter supply capacity is adequate for the proposed installation.
The burner gas connection sizes are given in Fig. 1.
The gas supply pipe should be sized to allow the minimum operating pressure to be available at the burner inlet under full running conditions.
The pipe should be sized to prevent excessive pressure drops under full running conditions.
Where gas boosters are required attention is drawn to the Gas Act 1986, Schedule 5, Part II, paragraph 8 (4). Guidance is given in IM/16 "Guidance Notes on the Installation of Gas Pipework, Boosters and Compressors in Customers Premises" published by British Gas Plc. The gas booster should be electrically interlocked to the burner.

Adjustment by the factory

The boiler is adjusted by the factory to a maximum nominal heat load and for use with natural gas (G20)

Supply pressure

The supply pressure of natural gas must be between the following:
- 17,5 mbar
- max 25 mbar

The supply pressure is measured on the gas valve inlet (see Fig 12).
If the supply pressures are outside the range of 17.5-25 mbar, the boiler must not be put into operation. The gas utility company must be informed.

CO_2 content

When commissioning and during regular servicing of the boiler as well as after any conversion work on the boiler or the flue system, the CO_2 in the flue must be checked.

When running on natural gas, the CO_2 content must be between 8% and 8.5%. (Measure in the non condensing mode)

Too low CO_2 values may cause ignition problems. The CO_2 value is adjusted by setting the gas pressure on the gas valve (see Page 22).
The air volume set at the factory must not be changed.

Electrical Supply

A 230V 50Hz AC single phase electrical supply is required. The incoming mains supply should be terminated via a double pole fused isolator to the boiler, see Fig. 17 for wiring details. A fused supply is required. The Boiler has a 6,3 A internal fuse.

Power Requirements

The electrical supply is to feed control circuits and gas vales.

Typical loadings:	EC 90	130 W
	EC 120	150 W
	EC 160	175 W
	EC 200	200 W
	EC 250	320 W

All on site wiring shall conform to I.E.E. Regulations.

Wire lengths

Wires for sensors or bus information are not fed with mains voltage but with low voltage. They should not be put parallel to mains wires (this may lead to disturbances), otherwise screened wires have to be used.
Maximum lengths of wires for all sensors:
– Copper wires upto 20 m: 0,6 mm∅
– Copper wires upto 80 m: 1 mm^2
– Copper wires upto 120 m: 1,5 mm^2
Inside the boiler, al cables have to be laid in the cable clips an, when led out of the boiler, fixed in the strain relief clamps.

Circulating pumps

The electrical permitted load for each pump output is $I_{N\,max}$ = 1 A.

Fuses

Fuses in the control unit:
- F1 - T 6,3 H 250: mains

Connection

The wiring diagram must be followed!
Optional extras must be fitted and connected according to the instructions provided and the wiring diagram.
Connect to the mains. Check earth continuity and resistance to earth.

Outside temperature sensor (included)

The outside temperature sensor is located under the hood of the control unit. See wiring diagram for connection.

Replacing wires

All connecting wires apart from the mains connection must be replaced when necessary with special wire. When replacing the mains cable only cables Type H05VV-F complying with BS 6500 Table 16 must be used.

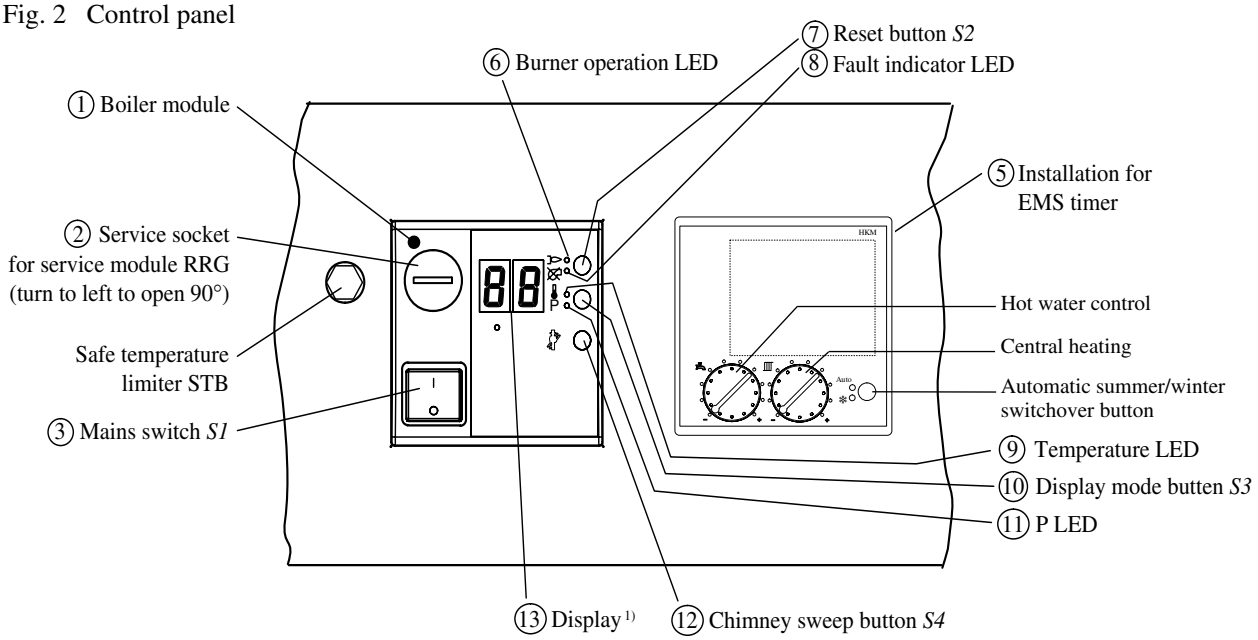
Commissioning

Before commissioning the boiler, read the operating instructions!
The exhaust gas levels must be checked.

The CO_2 content must lie between ➡ **8 - 8.5 % (Natural gas)**
9.5 - 10.0% (LPG, EC PLUS 90, 120)
9.0 - 9.5% (LPG, EC PLUS 160, 200, 250).

If the value is not reached, the gas pressure must be adjusted.
Commissioning must be undertaken by C.O.R.G.I. registered installers. The latter must inform the operator about handling and operation of the unit and its safety devices and hand over the operating instruction(s) for the central heating system. These instruction(s) must be kept permanently at the place of installation.

Fig. 2 Control panel


⑦ Reset button *S2*
⑥ Burner operation LED
⑧ Fault indicator LED
① Boiler module
⑤ Installation for EMS timer
② Service socket for service module RRG (turn to left to open 90°)
Hot water control
Central heating
Safe temperature limiter STB
Automatic summer/winter switchover button
③ Mains switch *S1*
⑨ Temperature LED
⑩ Display mode butten *S3*
⑪ P LED
⑬ Display 1)
⑫ Chimney sweep button *S4*

1) Display of boiler temperature (delivery state); all other values can be displayed after calling the parameter (see Table 7).

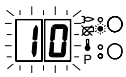
Commissioning

● Switch on the mains switch (3) on the boiler module (1). When sufficient water and gas pressure is present, the Eurocondense Plus can start operating.
● Set the central heating knob of the HKM to the desired boiler temperature value (without outdoor temperature sensor) or to the desired room temperature value (if an outdoor temperature sensor is connected). While turning the knob, the setpoint is displayed.
● Set the hot water knob to the desired hot water temperature value. While turning the knob, the setpoint is displayed.
● If the summer-/winter switch is set to “Automatic” or “Winter”, the PARAMOUNT starts operating in the heating or DHW mode. If it is set to “Summer”, the PARAMOUNT starts operating in the DHW mode.

Manual summer	Manual winter	Automatic mode
LED “Auto”	LED “Auto”	LED “Auto”
❍	❍	●
LED “❄”	LED “❄”	LED “❄”
❍	●	❍ or ● *)

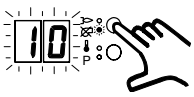
● The current boiler temperature is indicated on the display (13) and the green burner operating LED (6) illuminates when the burner is in operation.
Note: If an outdoor temperature sensor is not connected, the Eurocondense Plus is heated up to a boiler temperature of approx. 55 °C.

Fault display (8)



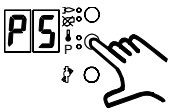
● If the burner does not start up, the red fault indicator LED (8) and display (13) flash with the error code (see Table 13).

Reset button (7)



The Eurocondense Plus can be reset with the Reset button (7) and the burner is then ready for a new start attempt. After a number of unsuccessful start attempts, inform a heating engineer depending on the error code present (Table 13).

Display mode button (10)



● With the Display mode button (10), the values (parameters, actual values or nominal values) listed in Table 7 can be checked and changes made.

Gas/air ratio control

With the gas/air ratio control for the Eurocondense Plus, the gas supply is adapted to the air supply, which is factory-set.
Adjustment should be accomplished at maximum and minimum nominal heat input, called full load and minimum load below.

Changing over from LPG to natural gas or vice versa

The type of gas for the Eurocondense Plus boiler should be changed only by an authorised gas installer.
To convert, replace the gas injector (Table 3) and adjust the CO_2 content by adjusting the injector pressure on the gas valve.
The CO_2 content should be between the following values at full load as well as at minimum load:

CO_2 content (natural gas): 8.3 % - 8.8 %
CO_2 content (LPG): 9.5 % - 10.0 % (EC PLUS 90, 120)
CO_2 content (LPG): 9.0 % - 9.5 % (EC PLUS 160, 200, 250)

Put the sticker with the new gas (provided with the kit) on the gas pipe.

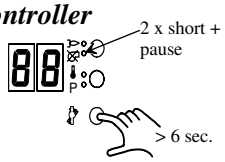
Adjusting and checking the CO_2 values

Controller stop mode (manual adjustment of burner capacity)

Operate the Eurocondense Plus in the **Controller stop mode** to adjust and check the CO_2 values.

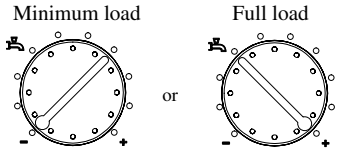
In the Controller stop mode, the burner can be set to all loads within the modulation range.
Check the adjustment of the CO2 values at full load and minimum load.

Activating Controller stop mode



Activate the controller stop mode on the boiler module (1): (See Fig. 2 for designation of controls).
Hold the "Chimney sweep" button (12) down for **more than 6 sec**. until the display "Fault" (8) **flashes in red** at intervals **(2 x short and pause)**.
The current, relative burner load then appears on the display (0 = min.; 100 = max.), whereby the number 100 is output in the form of a 1 and 00 in sequence.

Setting Controller stop mode
1st possibility
<u>On heating circuit module HKM:</u>



After activating the Controller stop mode on the boiler module, adjust the burner capacity on the HKM with the hot-water control (Fig. 8).
Left stop: Minimum load (-)
Right stop: Full load (+)
New settings are taken over immediately by the BMU.

Important!

It is always necessary to adjust both settings (full load and minimum load)!
After adjusting the minimum load, check the full load <u>again</u>!

<u>On room control module :</u>
RRG: not possible

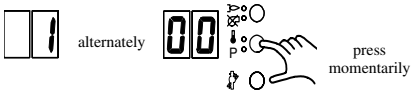
It is not possible to activate and adjust the Controller stop mode on the RRG! However, the display can be called up at the RRG Info level.

Completing CO_2 adjustment

2nd possibility
<u>On boiler module:</u>

To complete the CO2 adjustment, deactivate the Controller stop mode by pressing the "Chimney sweep" button (12) **> 1 sec**. and then releasing.

Full load setting

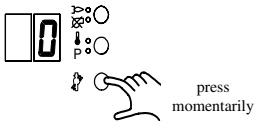


Adjustment of the full load and minimum load on the boiler module can be accomplished with the following steps:
100 does not appear on display (13):
To set the <u>max. boiler load</u> momentarily press the "Display mode" button (10).
The value "100" appears on display (13), i.e. the burner (fan) is now running at the setting for the max. burner load.

Full load setting on gas valve

Then set the gas valve to full load (adjustment screw for full load, Fig. 3) (see guide value for CO_2 in table 3).

Minimum load setting



To adjust the minimum boiler load momentarily press the "Chimney sweep" button (12).
The value "0" appears on the display (13), i.e. the burner (fan) is now running at the setting for min. burner load.

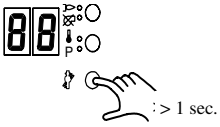
Minimum load setting on gas valve

Then, the minimum load can be set on the gas valve (adjustment screw for minimum load) (see guide value for CO_2).
Then check the full load, if the gas valve has been readjusted, check the minimum load again!

On room control module :
RRG: not possible

It is not possible to activate and adjust the Controller stop mode on the RRG! However, the display can be called up at the RRG Info level.

Completing
CO2 adjustment

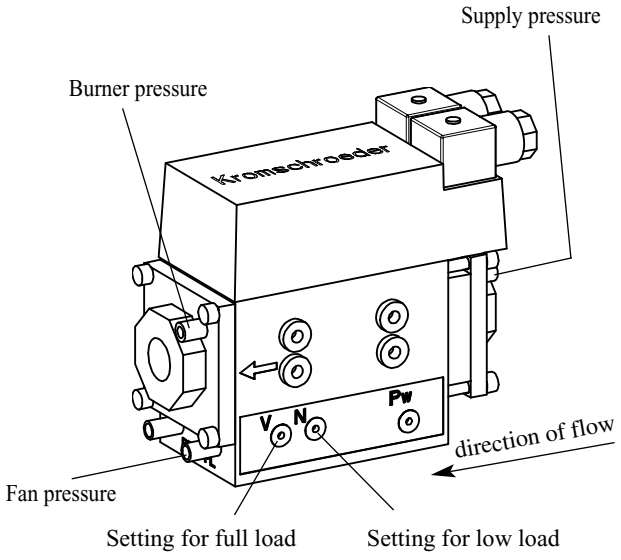


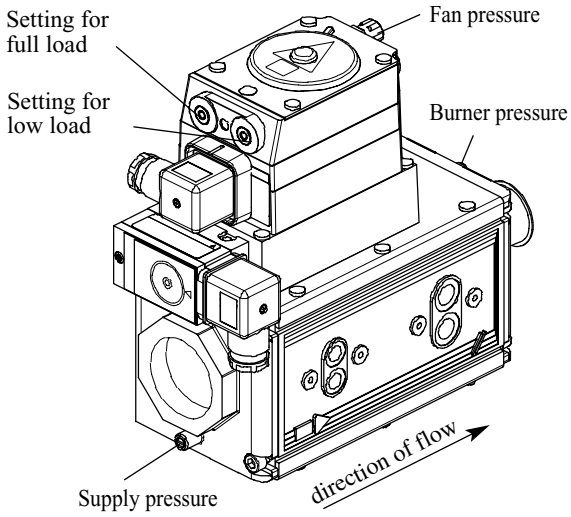
To complete the CO_2 adjustment, deactivate the Controller stop mode by pressing the "Chimney sweep" button (12) **> 1 sec**. and then releasing.

Fig. 3 Gas valves, Manufacturer: Fa. Kromschröder

for EC Plus 90 to 120: type CG 225 R01-VT2WF1Z
for EC Plus 160 to 200: type CG 240 R01-VT2WF1Z

for EC Plus 250: type CG 25/30





Guide values for gas flow rate, injector pressure and CO_2 content

The values given in Tables 3 are guide values. It is important that the gas quantity is set via the injector pressure so that the CO_2 value is within the specified values.

Table 3 Guide values for injector pressure (full load)

Model			EC Plus 90	EC Plus 120	EC Plus 160	EC Plus 200	EC Plus 250
Nominal heat input		kW	32,0 - 90,0	42,0 - 120,0	56,0 - 160,0	70,0 - 200,0	87,5 - 250,0
Nominal heat output	80/60 °C	kW	31,0 - 86,7	40,7 - 115,6	54,0 - 153,0	67,2 - 190,2	84,0 - 237,0
	50/30 °C	kW	33,0 - 92,7	43,3 - 123,6	52,2 - 163,5	71,8 - 205,0	88,3 - 252,3
Injector diameter for							
Natural gas (G20)		mm	8,50	10,0	10,0	11,5	12,3
LPG (propane)		mm	6,50	7,0	7,5	8,5	9.5
Gas type:			Guide values for injector pressure**				
- Natural gas G20 (15,0)*		mbar	6,0 - 8,0	5,5 - 7,5	9,5 - 11,0	9,0 - 10,5	13,0 - 14,5
- Propan		mbar	8,5 - 10,5	8,0 - 9,5	14,0 - 19,0	12,0 - 17,0	16,0 - 17,0

* Values in parenthesis = Wobbe index Wo_N in kWh/m³
** At pressure at end of boiler 0 mbar, 1013 hPa, 15 °C
the CO_2 content should be - between 8.0 and 8.5 % for natural gas
- between 9.5 and 10.0 % for LPG, EC PLUS 90, 120
- between 9.0 and 9.5 % for LPG, EC PLUS 160, 200, 250

Temperature setting

There are various setting possibilities for the temperature, see table 4.

Table 4 Operating modes (operation **with** outdoor temperature sensor)

Operation with	Room temperature setting	Hot-water temperature setting	Heating program
Room control module RRG 1)	On room control module RRG	On room control module RRG	On room control module RRG
Heating circuit module HKM 2) with timer	On heating circuit module HKM heater control	On heating circuit module HKM hot-water control	On EMS or DSU timer
Heating control module HKM with room thermostat	On room thermostat RAV, RTD or RTW (HKM heater control must be set to max. position!)	On heating circuit module HKM hot-water control	On room thermostat RAV, RTD or RTW

1) On mixed heating systems (application example 2) the room temperature setting applies for the pump and mixer heating circuit

2) On separate heating systems (application example 3) the room temperature setting on the heating circuit module HKM applies for the pump heating circuit The room and hot-water temperature setting on the room control module RRG applies for the mixer heating circuit

Boiler control via 0–10 V DC input signal (CISP clip-in relay module)

The boiler is provides with an input for a 0–10 V DC signal to control the boiler temperature or the boiler output directly.
– To activate this function, set param. 618 to 4 or 5 (see table 7 for details)
– For a proper use of this input, disconnect all external controls from the boiler (e.g. room control RRG) and set the heating curves to “1“ (parameters 532 and 533, see tab. 7).

Note: If any other relay module (e.g. CIST, CIR, CITF) is installed, the CISP must be taken out!

Cleaning

It is essential to clean the boiler, heat exchanger and burner once a year by an approved gas installer. The need to clean the boiler and burner can also be indicated by a CO emission value that exceeds 200 ppm. Before starting work, the gas valve must be closed and the electricity to the boiler turned off.

Condensate siphon

The condensate siphon should be cleaned every one or two years. To do this the upper screw connection on the siphon is loosened and the siphon is pulled away downwards. Remove the siphon completely with hose from the boiler, disconnect and rinse through with clean water. Re-assemble the siphon in reverse order.

Removing gas burner

Remove the gas burner before cleaning the heating surfaces. To do this disconnect the electrical wiring to the fan from the terminals and pull the hose of the air pressure from the fan.
● Unscrew the screw connection of the gas supply pipe in front of the gas solenoid.
● Pull off electrical wires and plugs from the gas solenoid, gas pressure switch, ignition electrodes as well as the ionization electrode
● Loosen securing nuts of the burner (SW13) and pull out the burner complete with mixing chamber, fan and gas solenoid forwards
● Clean burner pipes with soft brush.

Cleaning

Cleaning the heat exchanger and condensate sump.
- Remove cleaning cover at the front bottom of the condensate sump
- Clean with plastic or stainless steel brush and water using a normal detergent (e.g. washing up liquid). Finally rinse off with a gentle water jet.
- Re-fit cleaning cover
- Re-install burner after cleaning is completed
- Check nominal heat load and exhaust gas values

Electrodes

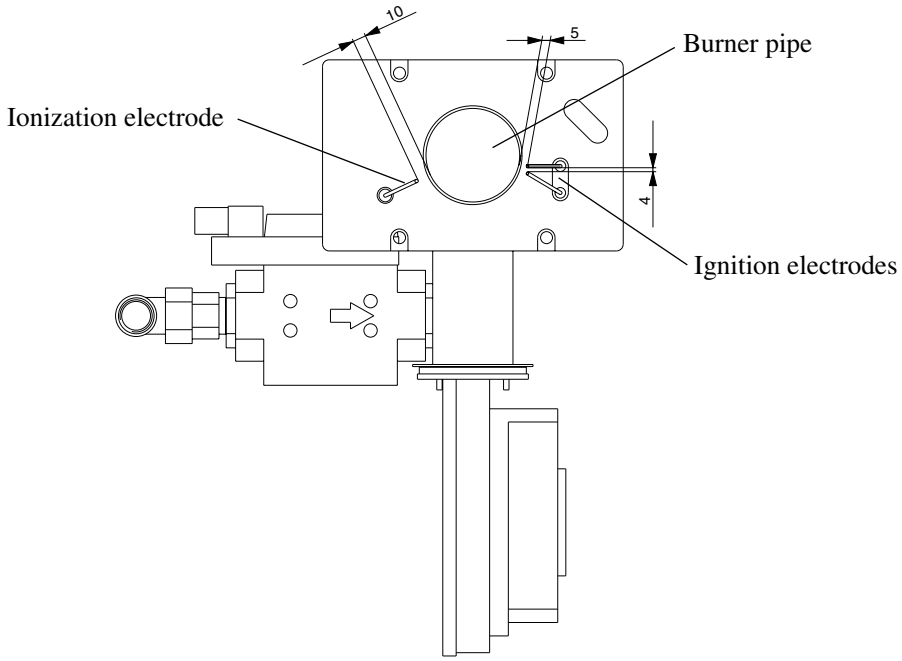
To ensure proper function of the ignition and ionization, ensure that installation length and spacings are observed as shown in Fig. 4.
The ionization current should have the following values for burner operation:
- at min. output > 5 µA, DC (switching threshold at 0.7 µA, DC)
- at max. output > 10 µA, DC

Ionization current indicator

The current ionization current can be checked as follows directly in µA:
- on boiler module (1) under parameter "C 1"
- using room control module RRG (optional extra)

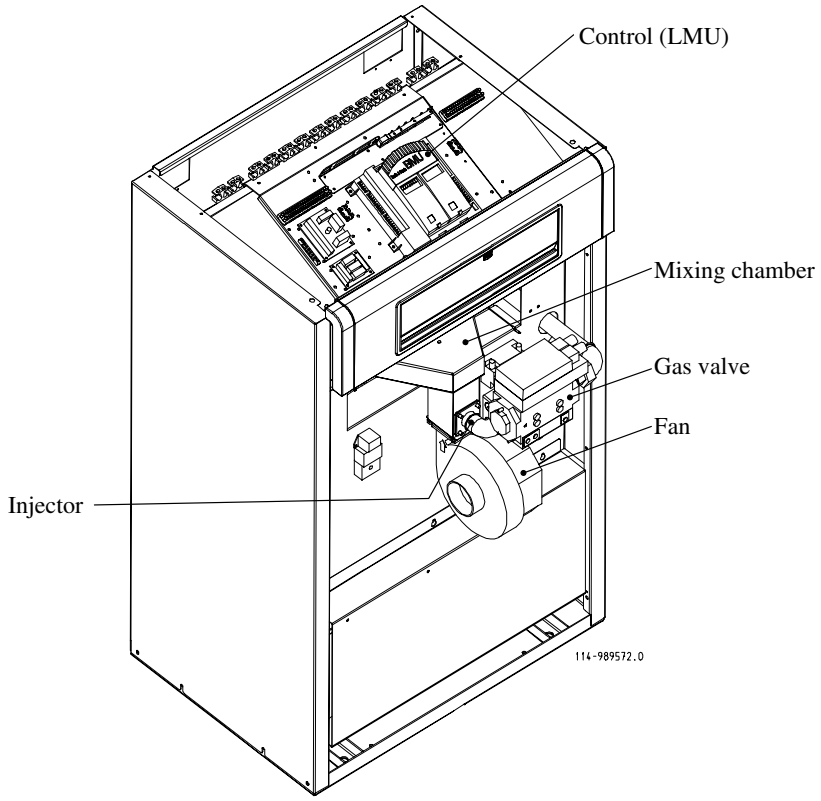
Fig. 4 Electrodes

View from the rear (combustion chamber)



BOILER VIEWS

Fig. 5 Boiler views Eurocondense Plus



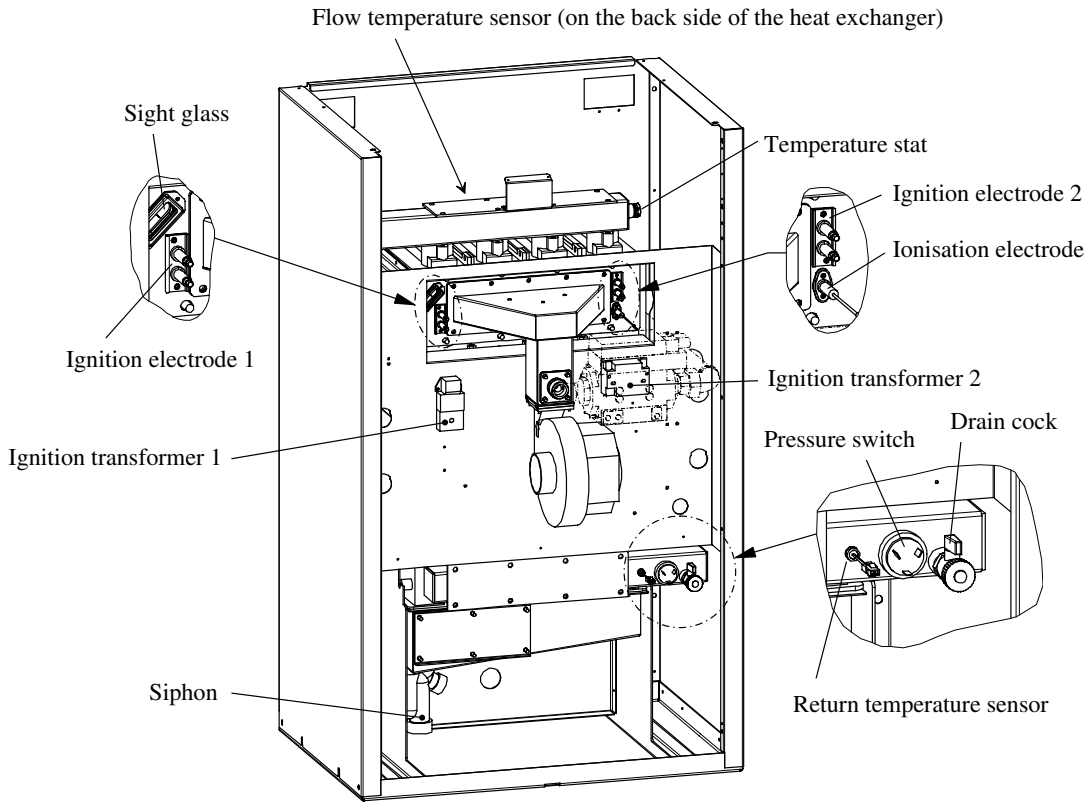
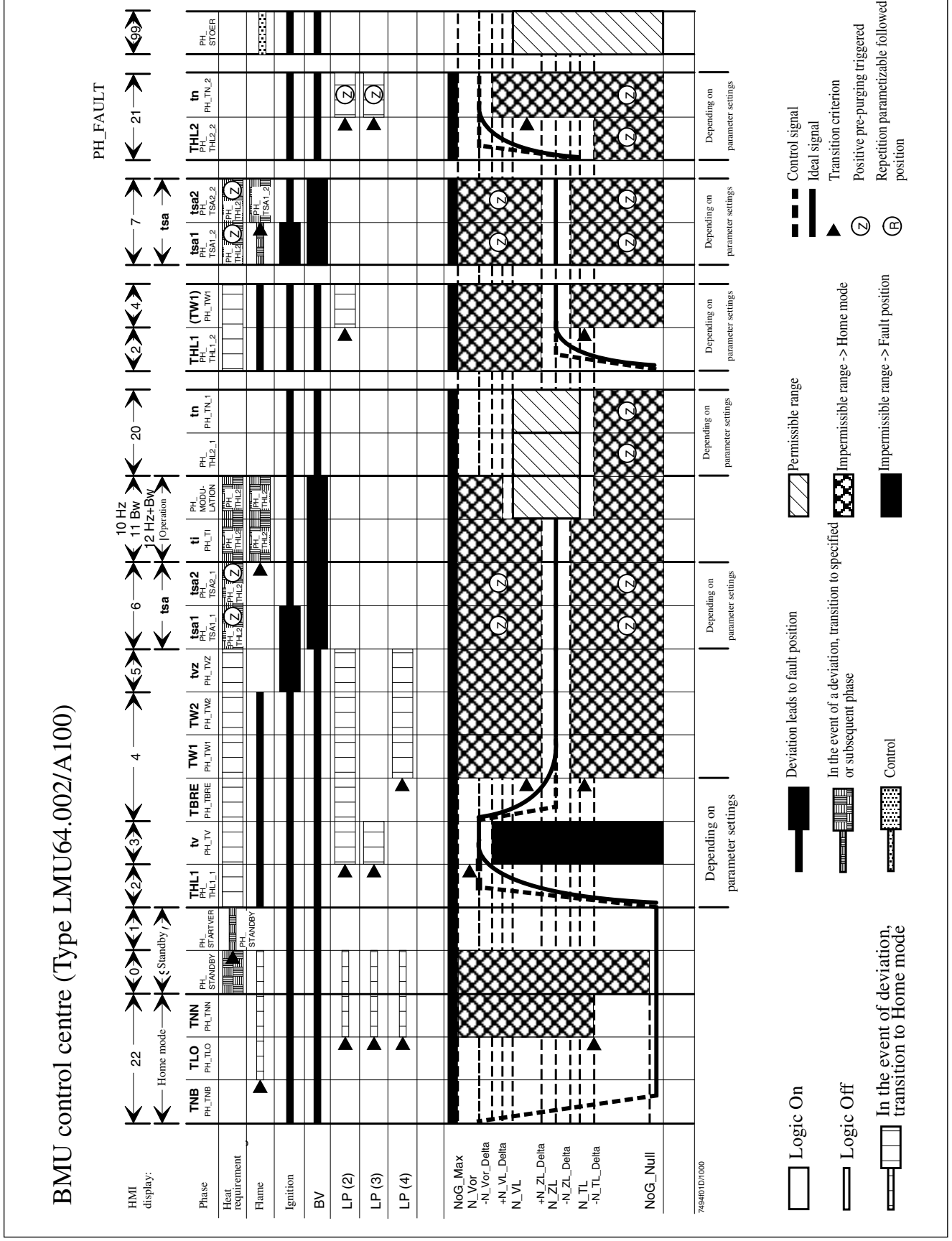


Fig. 6 BMU control centre program sequence (Type LMU64.002/A100)
(Continued on next page)



CONTROL CENTRE PROGRAM SEQUENCE

Time	Min. [s]	Max. [s]	Reaction at end	Designation
TNB	0,2	21,0	Fault position	Burner shut-off delay
TLO	0,2	51,0	Fault position	Open air pressure switch
TNN	0,2	51,0	Fault position	Up to speed = 0
THL1	0,2	51,0	Fault position	1st fan startup time
THL2	0,2	51,0	Fault position	2nd fan startup time
tv	0	51,0	Continuation	Pre-purging
TBRE	0,2	51,0	Fault position	Deceleration time to ignition load
TW1	0,2	10	Fault position	Wait for internal sequence, speed limitation and combustion optimization
TW2	0,2	1800,0	Home mode	Wait for "Heat demand" for Start function
tvz	0,2	5,0	Continuation	Preignition time
tsa	1,8	9,8		Safety time startup
tsa1	0,2	9,6 2)		Safety time startup with ignition
tsa2	0,2	tsa-tsa1		Safety time startup without ignition
ti	0,2	10	Continuation	Interval time mode
THL2	0,2	51,0	Fault position	2nd fan startup time
tn	0	51,0	Continuation	Subsequent ventilation

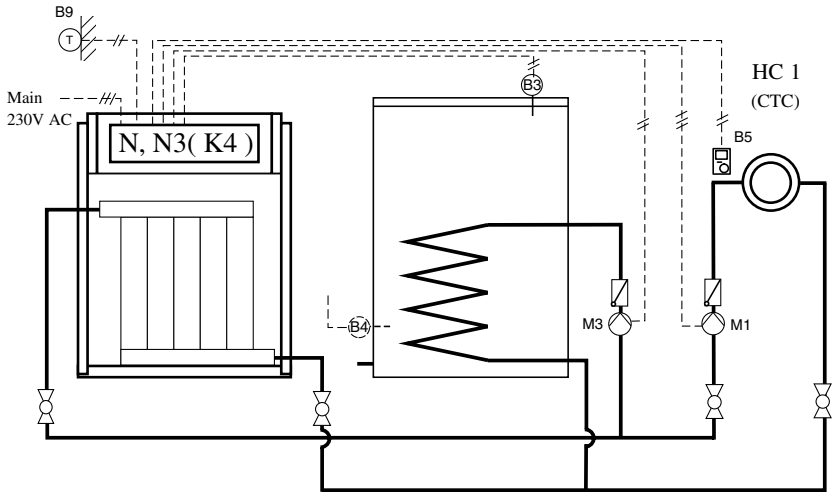
Table 5 Operating phases of control centre

Code "A 4"	Operating state	Function description
0	Standby (no heat requirement)	Burner on standby
1	Start disable	
2	Fan startup	Self-test for burner start and fan startup
3	Pre-purging time	Pre-purging, fan deceleration time to starting load speed
4	Waiting time	
5	Ignition phase	Ignition and start of safety time Flame formation, ionization current build up
6	Safety time constant	
7	Safety time variable	
10	Heating operation	Room heating mode, burner in operation
11	Hot water mode	Hot-water tank charging, burner in operation
12	Parallel operation for heating and hot water	
20	Subsequent ventilation with last operating fan speed	Fan continues to run
21	Subsequent ventilation with pre-purging fan speed	Fan continues to run
22	Shut down	Self-test after controlled shut-down
99	Fault position	The current fault code is indicated, see Table 13

Example **1a**:
(Hydr. System "2")

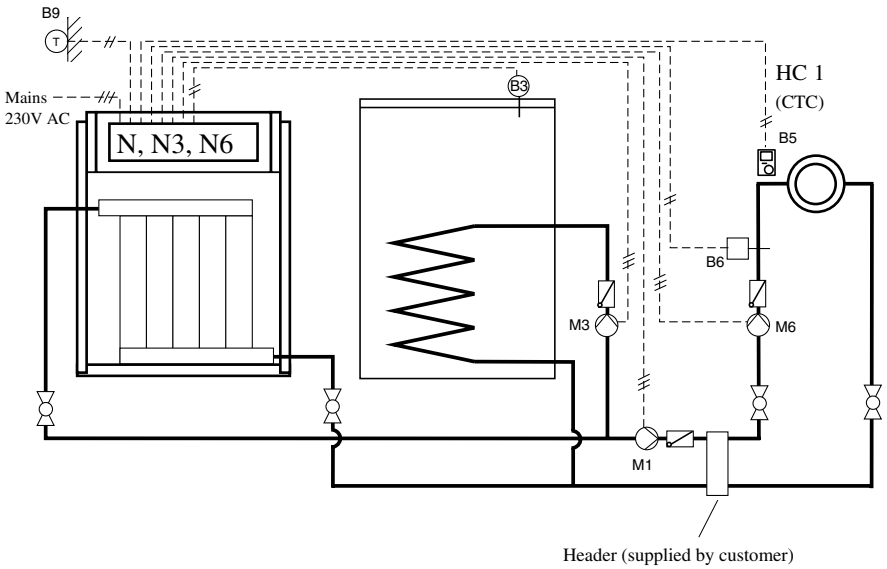
1 constant temperature heating circuit with room control RRG or with heating module HKM and timmer EMS, including DHW tank temperature control

Legend:
B3 Tank sensor QAZ 36 *)
B5 Room control RRG *) 1)
B9 Outdoor temperature sensor QAC 34
M1 Pump, constant temperature circuit *)
M3 Tank charging pump *)
N Control unit LMU
N3 Heating module HKM *) 1)
*) optinal extra
1) alternatively RRG or
HKM + EMS



Example **1b**:
(Hydr. System "2")

1 constant temperature heating circuit with room control RRG or with heating module HKM and timer EMS, including DHW tank temperature control, with primary loop/ header and secondary loop pump M6.



Legend:
B3 Tank sensor QAZ 36 *)
B5 Room control RRG *) 1)
B6 Flow sensor QAD 21 *)
B9 Outdoor temperature sensor QAC 34
M1 Primary loop pump
M3 Tank charging pump
M6 Secondary loop pump (constant temperature heating circuit)
N Control unit LMU
N3 Heating module HKM
N6 Temperature relay module CITF (for B6 and M6)

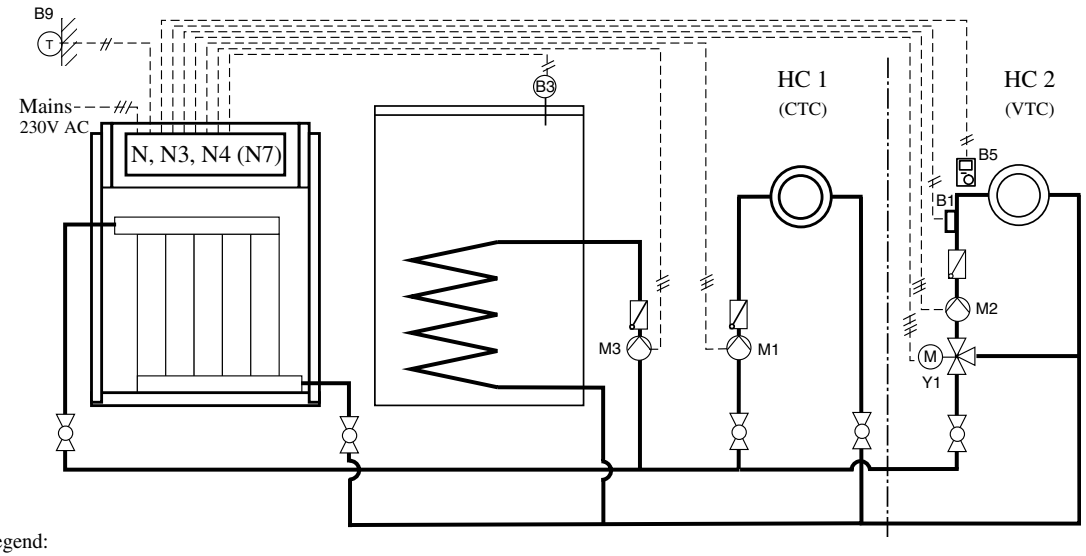
*) optional extra
1) alternatively RRG or
HKM and EMS

HYDRAULIC CIRCUITS (EXAMPLES)

Example **2a**:
(Hydr. System "50")

1 constant temperature heating circuit (CTC) an 1 variable temperature heating circuit (VTC) with room control RRG and/or with heating module HKM and timer EMS, including DHW tank temperature control

Alternatively: VTC with zone controller ZR EC 1/2



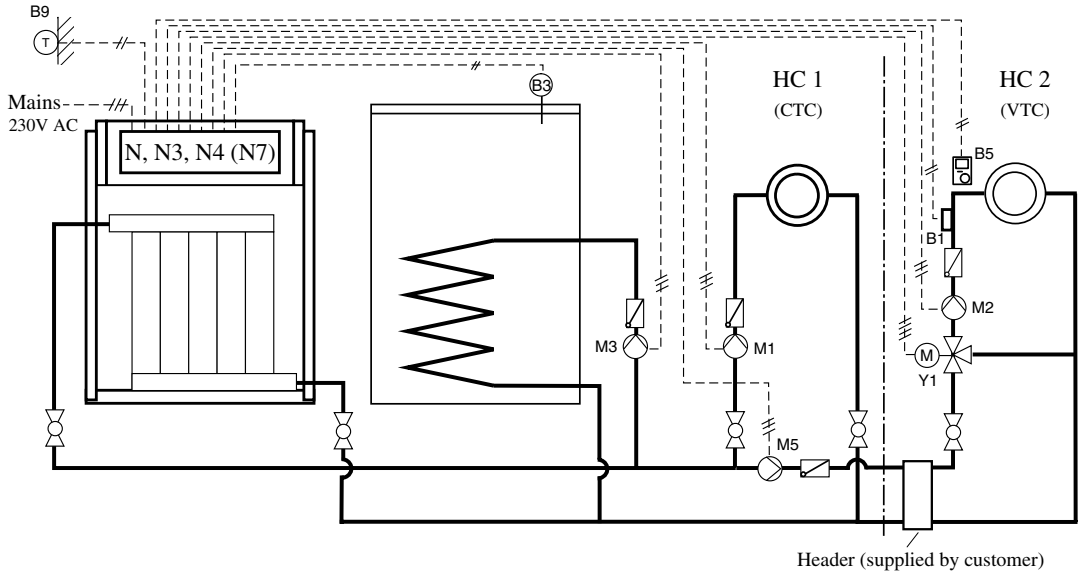
Legend:

B1	Flow sensor QAD 36 *)	M1	Pump, constant temp. heating circuit *)	N4	Mixer module CIM *)
B3	Tank sensor QAZ 36 *)	M2	Pump, variable temp. heating circuit *)	N7	Zone control ZR EC 1/2 [1])
B5	Room control RRG *)	M3	Tank charging pump *)	Y1	3 way valve *)
B9	Outdoor temperature sensor QAC 34	N	Control unit LMU	*) optional extra	
K1	Bus module CIB *)	N3	Heating module HKM *)	[1]) alternatively: CIM or ZR EC 1/2 with CIB	

Example **2b**:
(Hydr. System "50")

1 constant temperature heating circuit (CTC) and 1 variable temperature heating circuit (VTC) with room control RRG and/or with heating module HKM and timer EMS, including DHW tank temperature control, with primary loop / header and secondary loop pump M5

Alternatively: VTC with zone controller ZR EC 1/2

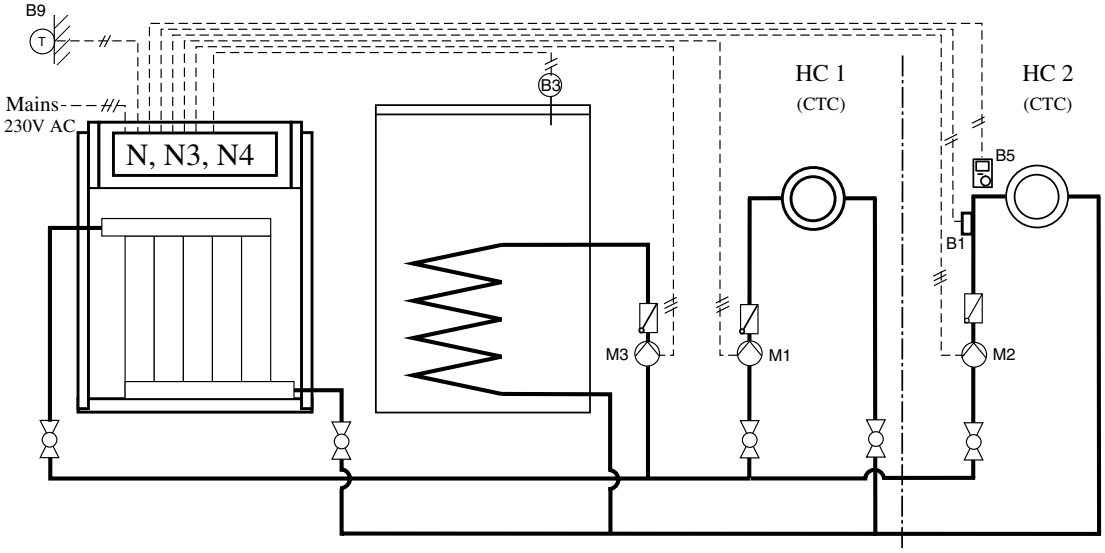


Legend:

B1	Flow sensor QAD 36 *)	M1	Pump, constant temp. heating circuit *)	N3	Heating module HKM
B3	Tank sensor QAZ 36 *)	M2	Pump, variable temp. heating circuit *)	N4	Mixer module CIM *) [1])
B5	Room control RRG *)	M3	Tank charging pump *)	N7	Zone control ZR EC 1/2 [1])
B9	Outdoor temperature sensor QAC 34	M5	Primary loop pump *)	Y1	3 way valve *)
K1	Bus module CIB [1])	N	Control unit LMU	*) optional extra	
				[1]) alternatively: CIM or ZR EC 1/2 with CIB	

Example **3**:
(Hydr. System "34")

2 constant temperature heating circuit (CTC) with a mixer module CIM and room control RRG and/or with heating module HKM and timer EMS, including DHW tank temperature control

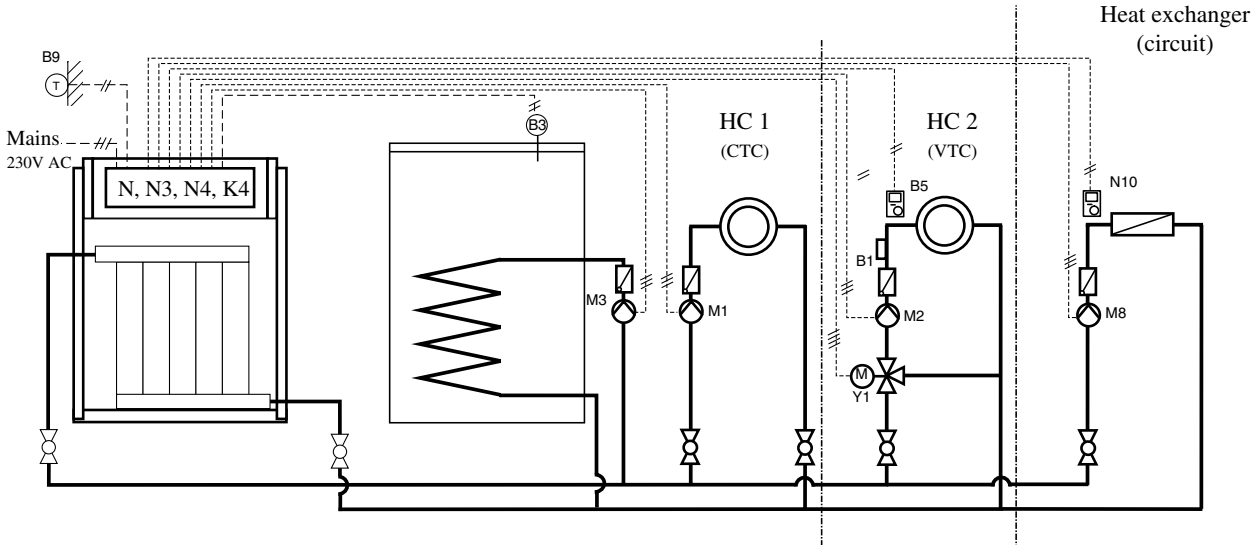


Legende:

B1	Flow sensor QAD36 *)	M1	Pumpe, 1st constant temp. heating circuit *)	N3	Heating module HKM
B3	Tank sensor QAZ 36 *)	M2	Pumpe, 2nd constant temp. heating circuit *)	N4	Mixer module CIM *)
B5	Room control RRG *)	M3	Tank charging pump *)	*) optional extra	
B9	Outdoor temperature sensor QAC 34	N	Control Unit LMU		

Example **4**:
(Hydr. System "66")

1 CTC, 1 VTC with room control RRG and/or with heating module HKM and timer EMS, including DHW tank temperature control, and 1 pump circuit with heat exchanger (e. g. air heater) with zone control ZR EC 1/2



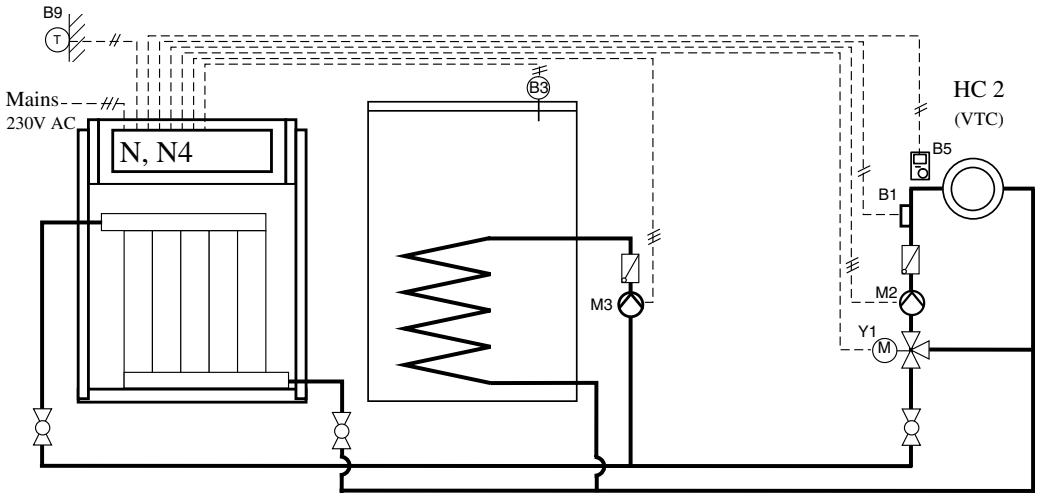
Legend:

B1	Flow sensor QAD 36 *)	M3	Tank charging pump *)	Y1	3 way valve
B3	Tank sensor QAZ 36 *)	N	Control unit LMU	*) optional extra	
B5	Room control RRG *)	N3	Heating module HKM		
B9	Outdoor temperature sensor QAC 34	N4	Mixer module CIM *)		
K4	Switch life relay module CIR *)	N7	ZR EC 1//2 heat exchanger circuit		
M1	Pump, constant temperature heating circuit *)	N10	External switching contact (for heat exchanger circuit)		
M2	Pump, variable temperature heating circuit *)				

HYDRAULIC CIRCUITS (EXAMPLES)

Example **5a**:
(Hydr. System “50”)

1 variable temperature heating circuit (VTC) with CIM and room control RRG, including DHW tank temperature control
Alternative: VTC with zone controller ZR EC 1/2

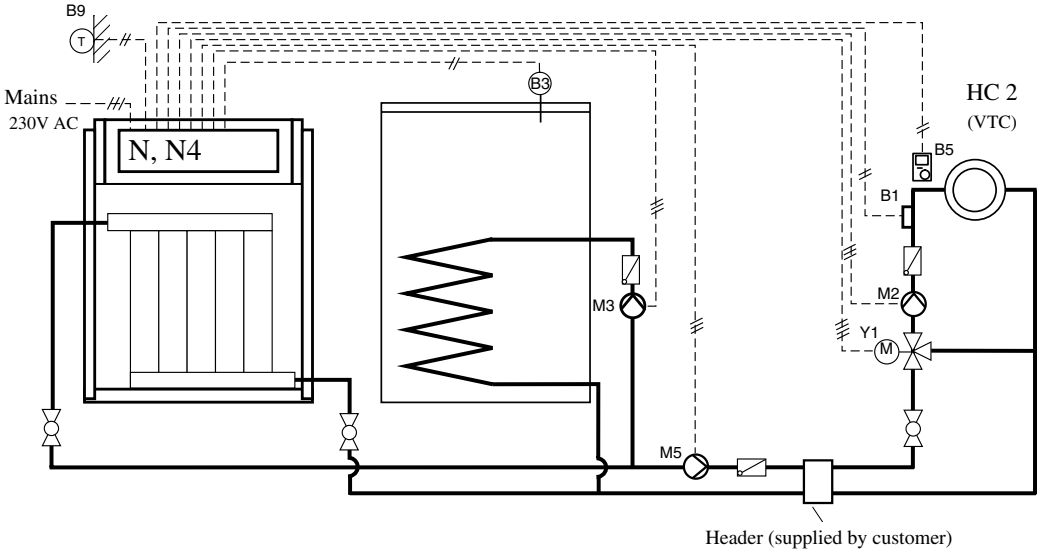


Legend:

B1	Flow sensor QAD 36 *)	K1	Bus module CIB [1])	N4	Mixer module CIM *) [1])
B3	Tank sensor QAZ 36 *)	M2	Pump, variable temp. heating circuit *)	N7	Zone control ZR EC 1/2 [1])
B5	Room control RRG *)	M3	Tank charging pump *)	Y1	3 way valve *)
B9	Outdoor temperature sensor QAC 34	N	Control unit LMU	*) optional extra	
				[1]) alternatively: CIM or ZR EC 1/2 with CIB	

Anwendungsbeispiel **5b**:
(Hydr. System “50”)

1 variable temperature heating circuit (VTC) with CIM and room control RRG, including DHW tank temperature control,
with primary loop / header and secondary loop pump M5
Alternatively: VTC with zone controller ZR EC 1/2

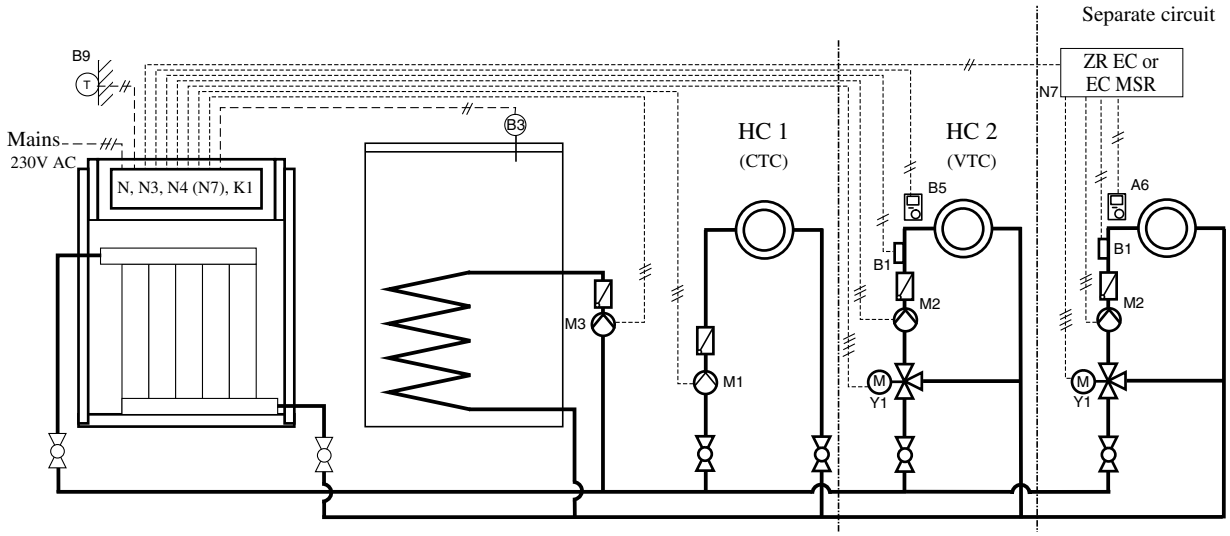


Legende:

B1	Flow sensor QAD 36 *)	K1	Bus module CIB [1])	N4	Mixer module CIM *) [1])
B3	Tank sensor QAZ 36 *)	M2	Pump, variable temp. heating circuit *)	N7	Zone control ZR EC 1/2
B5	Room control RRG *)	M3	Tank charging pump *)	Y1	3 way valve *)
B9	Outdoor temperature sensor QAC 34	M5	Primary loop pump *)	*) optional extra	
		N	Control unit LMU	[1]) alternatively: CIM or ZR EC 1/2 with CIB	

Example **6a**:
(Hydr. System "66")

1 CTC, 1 VTC with CIM and room control RRG and/or heating module HKM and timer EMS, including DHW tank temperature control,
1 additional mixer circuit (VTC) with ZR EC 1/2 (up to 15 circuits possible)
Alternatively: Both VTCs with zone controller ZR EC 2

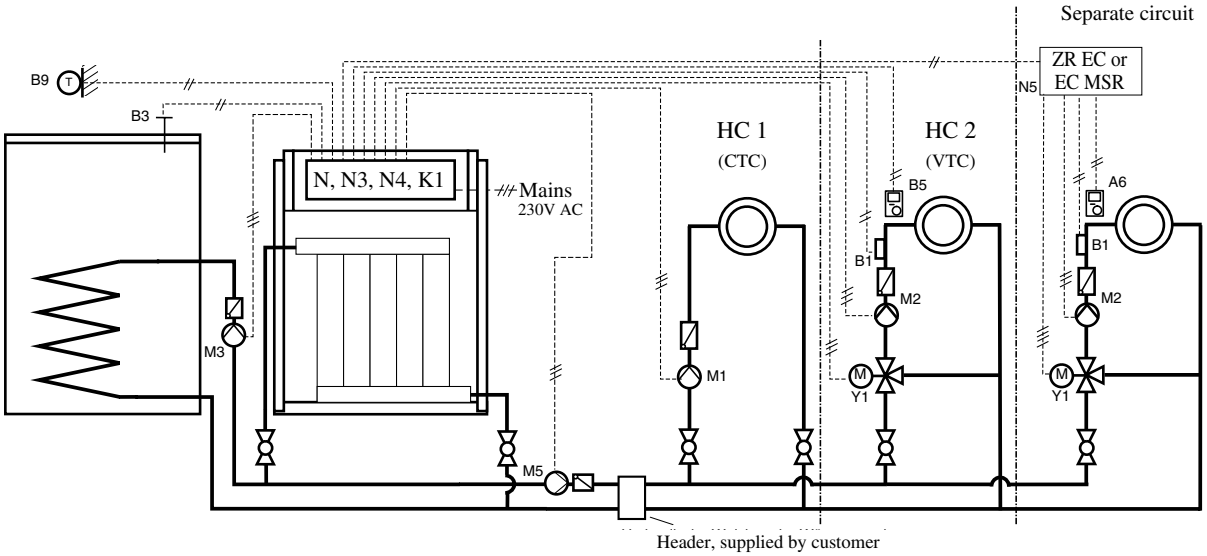


Legende:
B1 Flow sensor QAD36 *)
B3 Tank sensor QAZ 36 *)
B5 Room control RRG *)
B9 Outdoor temperature sensor QAC 34
M1 Pump, constant temp. heating circuit *)
M2 Pump, variable temp. heating circuit *)
M3 Tank charging pump *)
N Control unit LMU
N3 Heating module HKM
N4 Mixer module CIM *) [1]
N7 Zone control ZR EC 1/2
Y1 3 way valve *)
*) optional extra
[1]) alternatively: CIM or ZR EC 2 with CIB

Legend ZR EC:
A6 Room control QAA 70 or QAA 50
B1 Flow sensor QAD 21 *)
K1 Bus module CIB *)
M2 Pump, variable temp. heating circuit
N7 Zone control ZR EC / ZR MSR oder EC M [1])
Y1 3 way valve *)
*) optional extra

Example **6b**:
(Hydr. System "66")

1 CTC, 1 VTC with CIM and room control RRG and/or heating module HKM and time EMS, including DHW tank temperature control, with primary loop,
1 additional mixer circuit (VTC) with ZR EC 1/2 (up to 15 circuits possible)



Legend:
see example **6a**

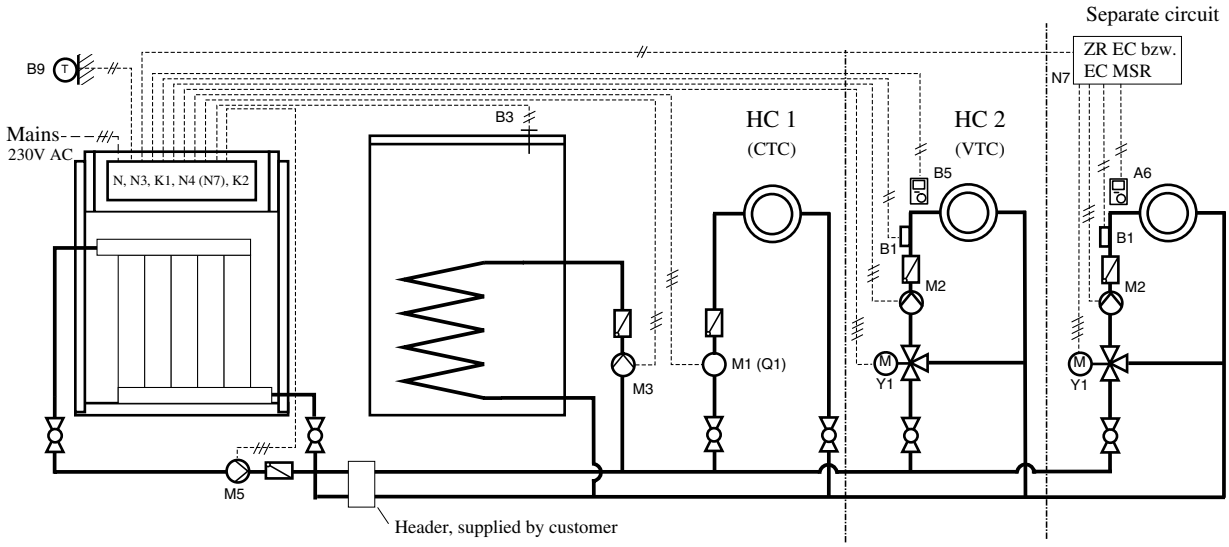
M5 Primary loop pump

Legend ZR EC or EC MSR:
see example **6a**

HYDRAULIC CIRCUITS (EXAMPLES)

Example **6c**:
(Hydr. System "66")

1 CTC, 1 VTC with CIM and room control RRG and/or heating module HKM and time EMS, including DHW tank temperature control, with primary loop.
DHW tank in the secondary loop.
1 additional mixer circuit (VTC) with ZR EC 1/2 (up to 15 circuits possible)



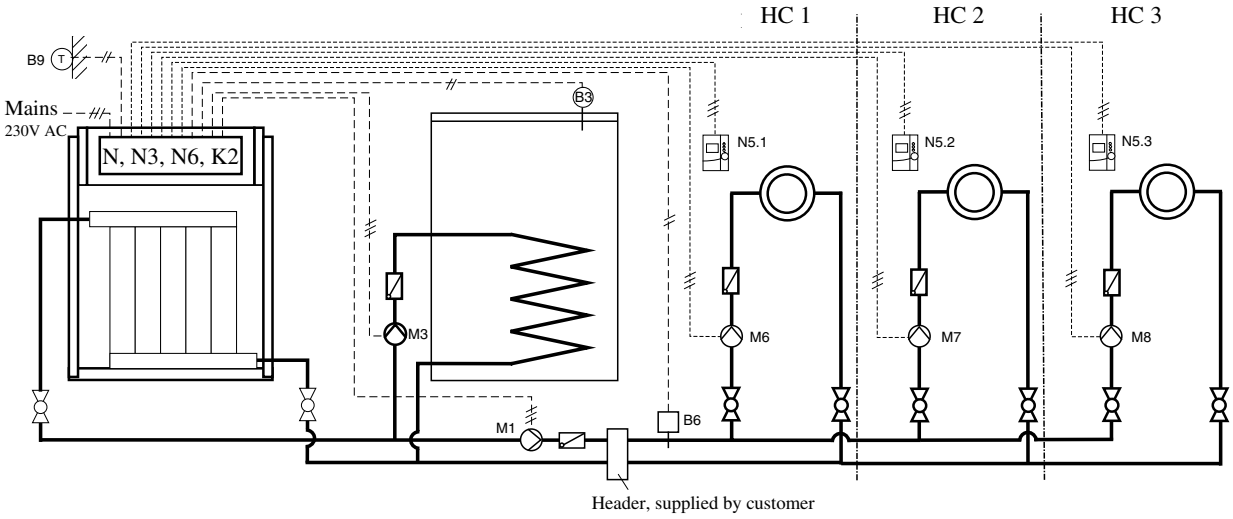
Legend:
see example **6a**

M5 primary loop pump

Legend ZR EC or EC MSR:
see example **6a**

Example **7**:
(Hydr. System "2")

3 CTC with room thermostats (N5.1 to N5.3) and HTS 2, including DHW tank temperature control, with primary loop

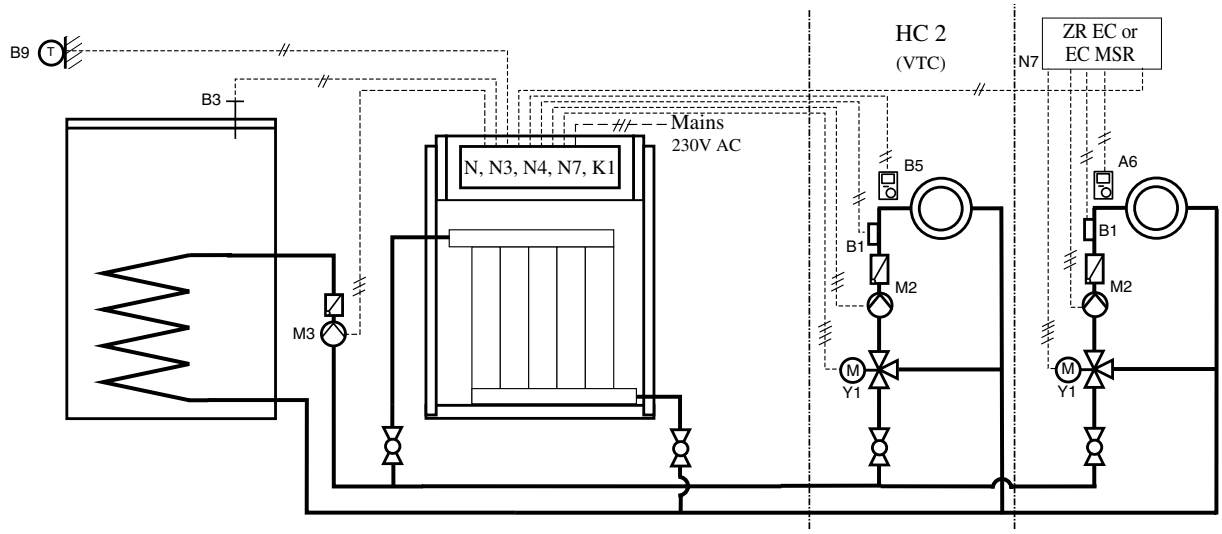


Legende:

B3 Tank sensor QAZ 36 *)
B6 Flow sensor QAD 36
B9 Outdoor temperature sensor QAC 34
K2 Extension module HTS 2 *)
M1 Primary loop pump *)
M3 Tank charging pump*)
M6 Pump CTC 1
M7 Pump CTC 2
M8 Pump CTC 3
N Control unit LMU
N3 Heating module HKM with EMS timmer *)
N5.1 Room thermostat, heating circuit 1
N5.2 Room thermostat, heating circuit 2
N5.3 Room thermostat, heating circuit 3
N6 Temperature relay module CITF
*) optional extra

Example **9a**: (Hydr. System "66")

1 VTC with CIM and room control RRG and/or heating module HKM and time EMS, including DHW tank temperature control,
1 additional mixer circuit (VTC) with ZR EC 1/2 (up to 15 circuits possible)
Alternatively: Both VTCs with zone controller ZR EC 2

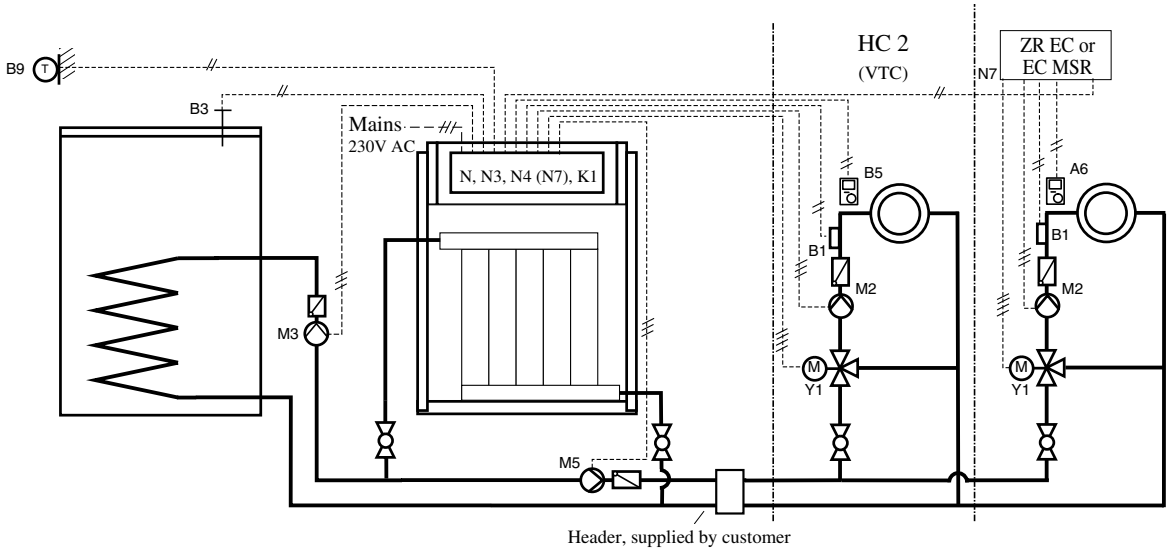


Legend:
B1 Flow sensor QAD 36 *)
B3 Tank sensor QAZ 36 *)
B5 Room control RRG *)
B9 Outdoor temperature sensor QAC 34
M2 Pump, variable temp. heating circuit *)
M3 Tank charging pump *)
N Control unit LMU
N3 Heating module HKM
N4 Mixer module CIM *) [1]
Y1 3 way valve *)
*) optional extra
[1]) alternatively: CIM or ZR EC 2 with CIB

Legend ZR EC:
B1 Flow sensor QAD 21 *)
B5 Room control QAA 70 *)
K1 Bus module CIB *)
M2 Pump, variable temp. heating circuit
N7 Zone control ZR EC / ZR MSR or EC M [1])
Y1 3 way valve *)
*) optional extra

Example **9b**: (Hydr. System "66")

1 VTC with CIM and room control RRG and/or heating module HKM and time EMS, including DHW tank temperature control, with primary loop,
1 additional mixer circuit (VTC) with ZR EC 1/2 (up to 15 circuits possible)
Alternatively: Both VTCs with zone controller ZR EC 2



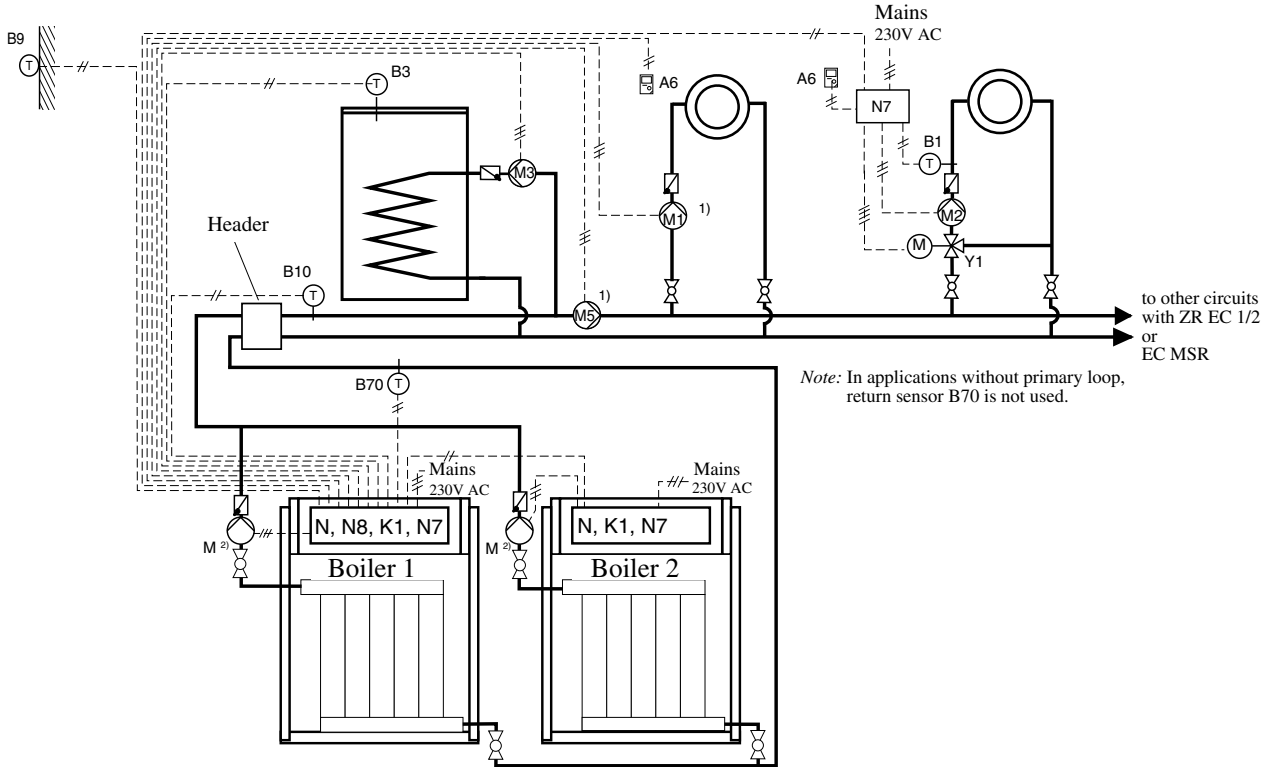
Legend:
see example **9a**

M5 Primary loop pump *)
*) optional extra

Legend ZR EC / EC MSR or EC M:
see example **9a**

HYDRAULIC CIRCUITS (EXAMPLES)

Example **11**: Boiler cascade with 2 EUROCONDENSE PLUS and BCA 2: 1 CTC and 1 VTC
(Hydr. System "80") (up to 15 circuits possible) including DHW tank temperature control (via BCA 2)



Note: In applications without primary loop, return sensor B70 is not used.

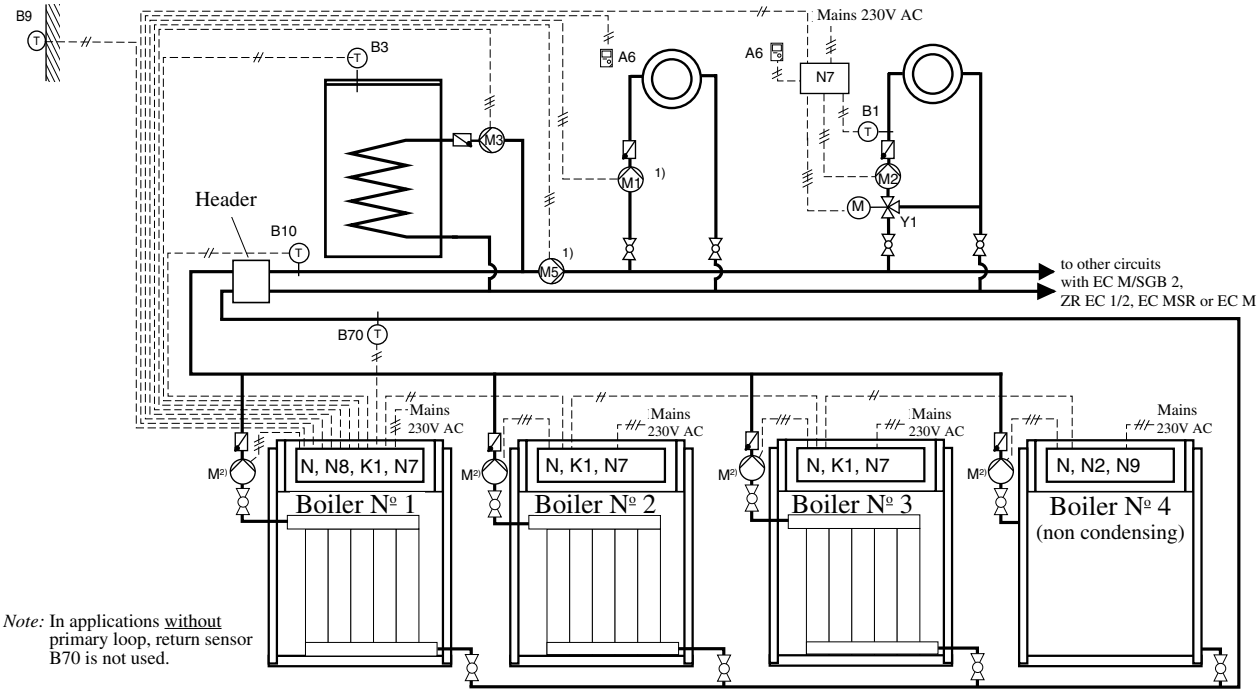
Legend:

A6	Room control QAA 70 or QAA 50	M	Boiler pump (exit M1 of individual boiler	N7	EC M / EC ZR 1/2 EC MSR for mixer circuits
B1	Flow sensor QAD 21	M1	Pump, CTC of the BCA or primary loop pump 1)	N8	EC BCA
B3	Tank sensor QAZ 21	M2	Pump VTC	Y1	3 way valve *)
B9	Outdoor temp. sensor QAC 31	M3	Tank charging pump		
B10	Flow sensor QAD 21	N	Control unit LMU		
B70	Return sensor QAD 21				
K1	Bus module CIB				

1) M1 or M5, before or behind the tank, see param. 99 of BCA 2 for details

Example **14**: (Hydr. System "80")

Mixed cascade with condensing and non condensing boilers (3 EUROCONDENSE PLUS and 1 non condensing boiler) with 1 BCA 2 and 1 EUROCONTROL KK.
1 VTC (up to 15 possible), 1 CTC, including DHW tank temperature control:
1 CTC and 1 VTC (up to 15 circuits possible) including DHW tank temperature control (via BCA 2)



Legend:

A6	Room control QAA 70 or QAA 50	M	Boiler pump (exit M1 of individual boiler)	N7	EC M / EC ZR 1/2 / EC MSR for mixer circuits
B1	Flow sensor QAD 21	M1	Pump, CTC (to BCA 2)	N8	EC BCA 2
B3	Tank sensor QAZ 21	M2	Pump, VTC (to BCA 2)	Y1	3 way valve *)
B9	Outdoor temp. sensor QAC 31	M3	Tank charging pump (to BCA 2)		
B10	Flow sensor QAD 21	N	Control unit LMU	1)	M1 or M5, before or behind the tank, see param. 99 of BCA 2 for details.
B70	Return sensor QAD 21	N2	EUROCONTROL KK		
K1	Bus module CIB				

Explanations on the examples (necessary parameter changes, settings etc):

Parameter	Name	Factory setting	New setting	Remarks
Example 1b				
618	KonfigEingangR	0	6	Set input to "flow sensor"
619	KonfigAusgang1R	2	8	Set output to "secondary loop pump"

– Connect pump M1 to exit M1
– Connect pump M6 (max. 0.5 A) and sensor B6 to CITF (optional extra)

Example 2a/2b				
552	HydrSys	2	50	with CIM
			66	with ZR EC 1/2
553	KonfigHks (see table 10 for details)	21	21	Both circuits controlled by RRG
			10	CTC controlled by HKM/EMS VTC controlled by RRG
615	KonfigAusgang	2	0	2b (primary loop pump) only
558.0	KonfigRg4	0 (OFF)	1 (ON)	2b (primary loop pump) only

EXPLANATIONS ON THE EXAMPLES

Parameter	Name	Factory setting	New setting	Remarks
Example 3				
552	HydrSys	2	34	
553	KonfigHks (see table 10 for details)	21	21	Both circuits controlled by RRG
			10	CTC controlled by HKM/EMS VTC controlled by RRG
506, 507	TvSMin, TvSMax	20/70		Set according to user's needs (see table 7 for details)
Example 4 [1)]				
552	HydrSys	2	50	
553	KonfigHks (see table 10 for details)	21	21	Both circuits controlled by RRG
			10	CTC controlled by HKM/EMS VTC controlled by RRG
618	KonfigEingangR	0	3	Set to heat exchanger/door veil
619	KonfigAusgang1R	2	7	Set to heat exchanger/door veil
Example 5a/5b				
552	HydrSys	2	50	with CIM
			66	with ZR EC 1/2 and CIB
553	KonfigHks	21	10	VTC controlled by RRG
615	KonfigAusgang	2	0	5b (primary loop pump) only
558.0	KonfigRg4	0 (OFF)	1 (ON)	5b (primary loop pump) only
Example 6a/6b/6c				
552	HydrSys	2	66	
553	KonfigHks	21	21	Both circuits controlled by RRG
			10	CTC controlled by HKM/EMS VTC controlled by RRG
615	KonfigAusgang	2	0	6b, c (primary loop pump) only
558.0	KonfigRg4	0 (OFF)	1 (ON)	6b, c (primary loop pump) only
Example 7 [1)]				
552	HydrSys	2	2	
555.2	KonfigRg1	1 (ON)	0 (OFF)	Set room thermostat function
618	KonfigEingangR	0	6	Set input to "flow sensor"
619	KonfigAusgang1R	2	8	Set output to "secondary loop pump"

– Connect pump M1 to exit M1
– Connect pump M6 (max. 0.5 A) and sensor B6 to CITF

Example 9a/9b				
552	HydrSys	2	2	
615	KonfigAusgang	2	0	9b (primary loop pump) only
558.0	KonfigRg4	0 (OFF)	1 (ON)	9b (primary loop pump) only

– Connect primary loop pump to M5

Example 11, 14				
552	HydrSys	2	80	For all boilers in the system!
605	LPBAdrGerNr	1	1	1st condensing boiler in the cascade
			2	2nd condensing boiler in the cascade
			3	3rd condensing boiler in the cascade

– Any other parameter settings, see manuals of BCA 2 und EUROCONTROL KK for details.

General:
If external control such as ZR EC 1/2, EC MSR or EC M are used, always set the hydraulic system (param. 552) to 66.

[1)] *Note:* Take out CISP if another relay clip-in used, e.g. CIR, CIST, CITF.

Fig. 7 EUROCONDENSE PLUS wiring diagram

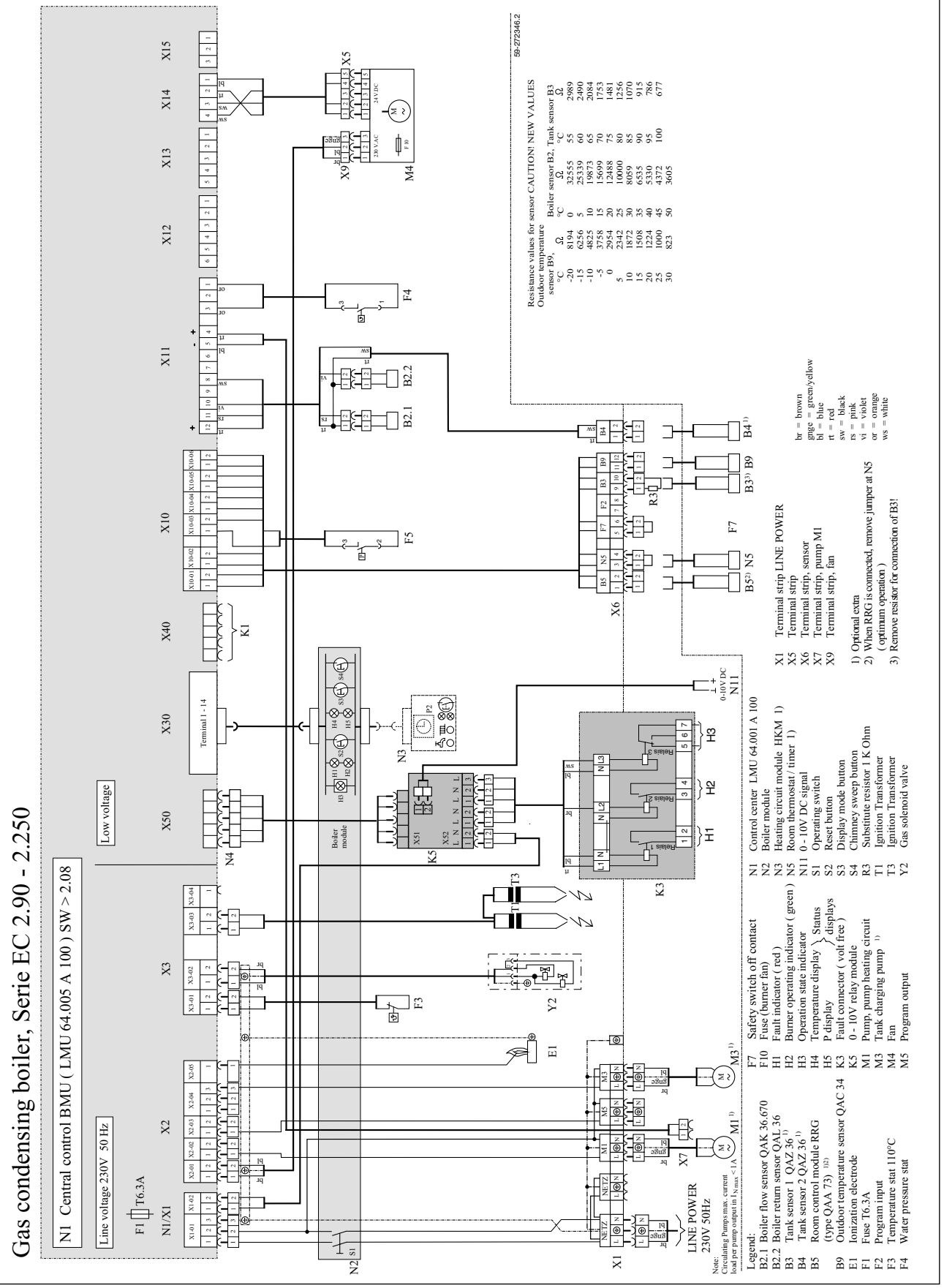

Gas condensing boiler, Serie EC 2.90 - 2.250
N1 Central control BMU (LMU 64.005 A 100) SW > 2.08
Line voltage 230V 50 Hz
Low voltage
LINE POWER 230V 50Hz
Terminal 1 - 14
Boiler module
Legend:
B2.1 Boiler flow sensor QAK 36.670
B2.2 Boiler return sensor QAL 36
B3 Tank sensor 1 QAZ 36 1)
B4 Tank sensor 2 QAZ 36 1)
B5 Room control module RRG (type QAA 73) 1)2)
B9 Outdoor temperature sensor QAC 34
E1 Ionization electrode
F1 Fuse T6.3A
F2 Program input
F3 Temperature stat 110°C
F4 Water pressure stat
F7 Safety switch off contact
F10 Fuse (burner fan)
H1 Fault indicator (red)
H2 Burner operating indicator (green)
H3 Operation state indicator
H4 Temperature display \ Status
H5 P display / displays
K3 Fault connector (volt free)
K5 0 - 10V relay module
M1 Pump, pump heating circuit
M3 Tank charging pump 1)
M4 Fan
M5 Program output
N1 Control center LMU 64.001 A 100
N2 Boiler module
N3 Heating circuit module HKM 1)
N5 Room thermostat / timer 1)
N11 0 - 10V DC signal
S1 Operating switch
S2 Reset button
S3 Display mode button
S4 Chimney sweep button
R3 Substitute resistor 1 K Ohm
T1 Ignition Transformer
T3 Ignition Transformer
Y2 Gas solenoid valve
X1 Terminal strip LINE POWER
X5 Terminal strip
X6 Terminal strip, sensor
X7 Terminal strip, pump M1
X9 Terminal strip, fan
1) Optional extra
2) When RRG is connected, remove jumper at N5
(optimum operation)
3) Remove resistor for connection of B3!
br = brown
gnge = green/yellow
bl = blue
rt = red
sw = black
rs = pink
vi = violet
or = orange
ws = white
Resistance values for sensor CAUTION! NEW VALUES
Outdoor temperature sensor B9,
°C Ω
-20 8194
-15 6256
-10 4825
-5 3758
0 2954
5 2342
10 1872
15 1508
20 1224
25 1000
30 823
Boiler sensor B2, Tank sensor B3
Ω °C Ω
32555 0 2989
25339 5 2490
19873 10 2084
15699 15 1753
12488 20 1481
10000 25 1256
8059 30 1070
6535 35 915
5330 40 786
4372 45 677
3605 50
59-272346.2

Table 6 Call-up and parameter values for BMU control centre
Note: Parameters in the groups "A, b, C and d" can only be called, parameters in group "P" can also be changed.

Display	Description	Adjustment range	[Units]	Display 1) Temperature	P
General: 2)					
A 0	Fault diagnosis code (system) 3)		[Code.No.]	☼	☼ 4)
A 1	Boiler temperature (flow)		[°C]	●	❍
A 2	Hot-water sensor 1		[°C]	☼	❍
A 3	Water or air pressure (not activated)		[-- . --]	❍	●
A 4	Automatic boiler operating phase (see Table 5, Page 18)		[Code.No.]	❍	❍
Actual temperatures					
b 0	Internal BMU SW diagnosis code 5)		[Code.No.]	☼	☼ 4)
b 1	Boiler temperature (return)		[°C]	●	●
b 2	Hot-water sensor 2 (not present)		[°C]	●	●
b 3	Flue gas temperature (not present)		[°C]	●	●
b 4	Current outdoor temperature		[°C]	●	●
b 5	Mixed outdoor temperature		[°C]	●	●
b 6	Attenuated outdoor temperature		[°C]	●	●
b 7	Mixer flow temperature (only when mixer module CIM is connected)		[°C]	●	●
Other process values					
C 1	Ionization current	(max. 30 µA)	[µA]	●	●
C 2	Fan speed (value x 100)		[rpm]	●	●
C 3	Current fan control (PWM signal)		[%]	●	●
C 4	Relative power (percent of max. output)		[%]	●	●
C 6	Difference between flow and setpoint temperature		[K]	●	●
Settings:					
d 1	Setting for two point or modulation control (PID)		[°C]	●	●
d 2	Current boiler temperature setpoint		[°C]	●	●
d 3	Setting for room temperature	(10 - 30 °C)	[°C]	●	●
d 4	Setting for hot-water temperature	(10 - 65 °C)	[°C]	●	●
d 5	Max. degree of modulation in heating mode	(PHZ max.)	[%]	●	●
d 6	Max. fan speed at max. output in heating mode	(NHZ max.)	[rpm]	●	●
Parameters:	(Setting only for special functions or. 6))				
P 0	Burner capacity (Controller stop without HKM) 0 = min., 100 = max.	(0 - 100)	[%]	●	☼
P 1	Room/flow temperature setting (without HKM)	(10 - 30 / 20 - 75 °C)	20/55 [°C]	●	☼
P 2	Setting for hot-water temperature (without HKM)	(10 - 65 °C)	45 [°C]	●	☼
P 3	Function not used		– –	●	☼
P 5	Steepness of heating curve	(1 - 40)	25 [Value]	●	☼
P 6	Parallel offset for heating curve	(- 31 K ... + 31 K)	[Value]	●	☼

Note: Other parameters displayed are not used

1) Display: ☼ = Flashing, ● = Illuminated, ❍ = Not illuminated
Parameters in the group "A" can be selected by momentarily pressing the display mode button

3) For error messages, see Table 13, Page 54, or instructions for EUROCONTROL controls

4) Display flashes alternatingly

5) Internal BMU SW diagnostic code (POTTERON Customer Service), selection of a few error codes

Code number	Explanation:	Remedy:
295	Gas valve possible short circuit to ground	Check and eliminate (internal BMU fuse defective)
477	Parameter P1 (Table 6) > TkSNorm (Prog. No. 505)	Adjustment error: Check settings and correct
479	Parameter P1 (Table 6) > TrSMax (Prog. No. 502	
425/426/427	STB_Gradient (boiler temperature increases too rapidly)	Probably air in heating or hot-water system or no water circulation; bleed boiler and heating system
433/435	STB_DELTA_T1, STB_DELTA_T3 (Delta-T too high for boiler flow and return)	
531	Exit M5 is already used	Check parameter 615 For software version 2.08 and more: Put the desired extra-function on the Relay Clip-In CIST, parameter 619, 620 and 621.

6) For boilers without HKM or for heating curve setting for operation with heating circuit module HKM
Note: **After 8 min. the display (15) automatically returns to the boiler temperature (A1)**

Calling parameter values

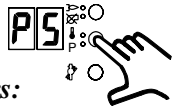
Proceed as follows to obtain the various parameter values (see also Fig. 2 "Control panel"):

Entering the Display mode

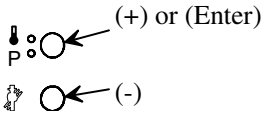
The Display mode can be entered by pressing the Display mode button (10) for a longer period (> 3 sec.) (Display (13): "A..").
Continue to hold down the button to proceed to the various display levels b, C, d, P and then A again.
Release the button in the desired display level (A, b, C, d, P).

Selection and display of individual values or parameters

It is possible to switch between the various values/ parameters (0 to max. 7) in the various display levels (A, b, C, d, P) by then momentarily pressing the Display mode button (10).
Approx. 2 sec. after selecting the parameter, the current value is displayed.



Changing parameters: (only P 0 to P 6)



It is only possible to change parameters (P0 through P6). For this purpose, wait until the value for the parameter flashes on the display (13). Basic procedure:

To increase value (+):	Press Display mode button (10) a number of times (< 3 sec.)
To decrease value (-):	Press Chimney sweep button (12) a number of times (< 3 sec.)
Store value (Enter):	Press Display mode button (10) for longer period **> 3 sec.**

Reject value (Esc)
For confirmation, "P 0" and the newly set value appear alternatingly in the display (13).
The new value set is taken over by the control centre only **after it is stored!**

Operating note

Complete changes/settings for values within 25 sec. at the latest. Otherwise, the BMU automatically returns to normal operation.
The display (13) automatically returns to the boiler temperature ("A 1" after 8 min.

ADJUSTEMENT TABLE FOR HEATING ENGINEERS

Table 7 Setting system-dependent parameters in heating specialist level of control centre BMU (with RRG room control module or RRG service module).

Procedure for changing parameters:

- Press Info button. Then press + / ▼ **or** + / ▲ buttons until "Initialize BMU parameters" appears on the display (final user level, only parameters with "X" are displayed!)
- Select heating specialist level: Press both buttons ▼ and ▲ for longer than 3 sec. until the display "Initialization BMU specialist" appears. (Level for heating specialist).
- Select the desired program No. by pressing the programming keys.
- Set the desired value by pressing the +/- keys.
- After selecting the next program No., the new value is taken over.
- Press the Info button to quit the programming level.

Display on room control module RRG			Function	Basic setting	New
Program. No.	BUM parameter final user level			(set at factory)	setting *)
501	TrSmin		Min. room temperature setting	10 °C	
502	TrSmax		Max. room temperature setting	30 °C	
503	TkSmin		Min. boiler temperature setting	20 °C	
504	TkSmax		Max. boiler temperature setting	88 °C	
505	TkSnorm		Boiler temperature setting at standard outdoor temperature	75 °C (not activated)	
506	TvSmin		Min. flow temperature setting, 2nd heating circuit	20 °C	
507	TvSmax		Max. flow temperature setting, 2nd heating circuit	70 °C	
510	TuebBw		Boil temperature setting increase for hot-water charging	18 °C	
511	TkSfrostEin		Boiler frost protection, switch-on temperature	5 °C	
512	TkSfrostAus		Boiler frost protection, switch-off temperature	10 °C	
514	TuebVor		Boiler temperature setting increase for VTC	10 K	
516	THG	X	Summer/winter switchover temperature	20 °C	
517	dTbreMinP		Max. control difference for termination when minimum pause time is exceeded	30 K	
519	TiAussenNorm		Standard outdoor temperature	- 20 °C (not activated)	
520	dTrAbsenk	X	Reduction of room temperature setting when timer is connected (HKM + EMS)	10 K	
521	dTkTrNenn		Flow/return temperature spread at standard outdoor temperature	20 K (not activated)	
523	SdHzEin		Switch-on difference - burner in heating mode	5 K 2)	
524	SdHzAusMin		Min. switch-off difference – burner in heating mode	4 K 2)	
525	SdHzAusMax		Max. switch-off difference – burner in heating mode	4 K 2)	
526	SdBwEin1		Switch on difference – burner in hot-water mode on sensor 1	4 K 2)	
527	SdBwAus1Min		Min. switch-off difference – burner in hot-water mode on sensor 1	2 K 2)	
528	SdBwAus1Max		Max. switch-off difference – burner in hot-water mode on sensor 1	2 K 2)	
529	SdBwEin2		Switch on difference – burner in hot-water mode on sensor 2	3 K 2)	
531	SdBwAus2Max		Max. switch-off difference – burner in hot-water mode on sensor 2	3 K 2)	
532	Sth1	X	Heating curve steepness, heating circuit 1	18 1)	
533	Sth2	X	Heating curve steepness, heating circuit 2	15 1)	
534	DtR1	X	Correction, room temperature setting, heating circuit 1	0 K	
535	DtR2	X	Correction, room temperature setting, heating circuit 2	0 K	
536	NhzMax		Max. fan speed at max. output in heating mode	see tab. 8	
537	NqmodNenn		Speed stage at heating system design point	30 (not activated)	
538	NqmodMin		Min. pump speed for heating system	34 % (not activated)	
539	NqmodMinBw		Min. pump speed for layer tank charging	40 % (not activated)	
541	PhzMax		Max. degree of modulation in heating mode	see tab. 8	
542	PminHuKw		Min. boiler input in kW (Hu)	see tab. 8 3)	
543	PmaxHuKw		Max. boiler input in kW (Hu)	see tab. 8 3)	
544	ZqNach		Pump overrun delay time, max. 218 min.	10 min	
545	ZBreMinP		Minimum pause time for burner	120 s 2)	

Display on room control module RRG Program. No.	BUM parameter final user level	Function	Basic setting (set at factory)	New setting *)
546	ZBreMinL	Minimum running time for burner	0 s	
547	ZReglVerz	Control delay after burner startup	60 s **2)**	
551	Kon	Constant for rapid reduction (without	4	
552	HydrSystem	room influence)	2	
553	KonfigHks	Hydraulic system setting Assignment of HKM or RRG to heating circuit [0…255], see Table 11	21	
555	KonfigRg1	Adjustment codes	00110100	
556	KonfigRg2	Adjustment codes	00000000 (not used)	
557	KonfigRg3	Adjustment codes	00000100 (not used)	
558	KonfigRg4	Adjustment codes	01000000	
561	KonfigRg7	Adjustment codes	00001110	
562	pH2Omin	Min. boiler water pressure	0,7 bar (not activated)	
563	pH2Omax	Max. boiler water pressure	2,5 bar (not activated)	
584	ZkickFkt	Time for pump output kick function	5 s **2)**	
596	ZeitAufZu	Running time for drive in heating circuit 2 (CIM); 30 to 873 s	150 s	
598	LmodRgVerz	Output during control delay time	25 % **2)**	
604	LPBKonfigO	Adjustment code for bus module CIB	00010000	
605	LPBAdrGerNr	LPB application address for BMU	1 - -	
606	LPBAdrSegNr	LPB segment address for BMU	0 - -	
607	TbwBereit	Reduced setting for hot water	40 °C	
614	KonfigEingang	Programmable input F2 0 = Standard; 1 = Modem function 2 = Modem function "neg. logic" 3 = Door veil	0	
615	KonfigAusgang	Programmable output M5 0 = Standard; 1 = Signal output; 2 = Alarm output, 3 = Operating signal, 4 = External transformer (transformer T2); 5 = M5 (Q2Y2); 6 = DHW circulation pump; 7 = Door veil; 8 = Primary loop pump; 9 = RegC1; 10 = Basic function K2; 11 = DHW loading function (layer tank only); 12 = Analog threshold	2	
618	KonfigEingangR	Programmable input on relay module: 0 = Standard (no function); 1 = modemfunction; 2 = modemfunction; 3 = door veil; 4 = temperature setpoint; 5 = heat output setpoint; 6 = sensor hydraulic switch *Note:* with CISP, only 4 and 5 possible	0	
619	KonfigAusgang1R	Function of output 1 relay module 0 = Standard; 1 = Signal output; 2 = Alarm output, 3 = Operating signal, 4 = External transformer (transformer T2); 5 = M5 (Q2Y2); 6 = DHW circulation pump; 7 = Door veil; 8 = Primary loop pump; 9 = not possible; 10 = Basic function K2; 11 = not possible 12 = Analog threshold	3	
620	KonfigAusgang2R	Function of output 2 relay module Setting as parameter 619	3	
621	KonfigAusgang3R	Function of output 3 relay module Setting as parameter 619	0	
622	TAnfoExtMax	Max. value of heat demand in case of external temperature setting (if param. 618 = 4)	100 °C	
623	PAnfoExtSchwelle	Switchpoint of the analog threshold (% of max. value) (if param. 618 = 5)	5 %	

ADJUSTMENT TABLE FOR HEATING ENGINEERS

Display on room control module RRG		Function	Basic setting	New
Program. No.	BUM parameter final user level		(set at factory)	setting *)
700	Stoer1	1st history value for fault code counter	Display **4)**	
701	StrPn1	1st history value for fault phase	Display **4)**	
702	StrDia1	1st history value for SW diagnostic code b0	Display **4)**	
703/706/ 709/712	Stoer2 / Stoer3 Stoer4 / Stoer5	2nd/3rd/4th and 5th history value for fault code counter	Display **4)**	
704/707/ 710/713	StrPn2 / StrPn3 StrPn4 / StrPn5	2nd/3rd/4th and 5th history value for fault phase	Display **4)**	
705/708/ 711/714	StrDia2 / StrDia3 StrDia4 / StrDia5	2nd/3rd/4th and 5th history value for SW diagnostic ode b0	Display **4)**	
715	Stoer_akt	Current value of fault code counter	Display **4)**	
716	StrPn_akt	Current value of fault phase	Display **4)**	
717	StrDia_akt	Current value of internal SW diagnostic code b0	Display **4)**	
718	BetrStd	Burner operating time	Display (h)	
719	BetrStdHz	Heating mode operating time	Display (h)	
720	BetrStdBw	Hot-water mode operating time	Display (h)	
721	BetrStdZone	Zone operating time	Display (h)	
722	InbetrSetz	Startup counter	Display (h)	
723	Pmittel	Average boiler output	Display (kW)	
724	MmiStatus	Current summer/winter setting for boiler module	Display	
725	OT_SwVersLMU	Parameter level	Display	
755	IonStrom	Display of actual ionization current value	Display	

Other parameters displayed are not relevant for operation of EUROCONDENSE PLUS!

*) Note: Any new settings to be recorded in manual!

1) These parameters should be optimized for adaptation to the specific heating system!

2) These parameters should be adjusted only when absolutely necessary!

3) These parameters should never be adjusted!

4) For a list of the internal software diagnosis codes, see manual of the RRG (room control) service module for a selection of fault codes, see table 6.

Explanations on heating specialist level

The EUROCONDENSE PLUS boiler is factory-set for operation and requires no changes as a rule.
However, a few parameters (see [1]) in the adjustment table for heating specialists), serve for adaptation to the specific heating system and should be optimized.
Note: The parameters marked with [2]) should only be readjusted in exceptional cases when absolutely necessary!

Explanations on Table 7

A room control module RRG or service module RRG (optional extra) is required for adjusting the parameters.

510 (TuebBw)
Boiler temperature setting increase for hot-water charging

This ensures efficient hot-water charging. The boiler temperature setting is increased when hot water is required. Increase: Quicker charging time; greater overshoot
Reduction: Slower charging time; less overshoot

514 (TuebVor)
Boiler temperature setting increase for mixer heating circuit

Increasing the flow temperature achieves a constant mixer flow temperature.
Increasing: Mixer flow temperature undershoot is avoided
Lowering: Mixer flow temperature undershoot possible

516 (THK)
Summer-/Winter-Changeover Temp.

The automatic S/W switchover is a function with a long-term effect which switches off the heating during the summer when the outdoor temperature is **higher** than the S/W switchover temperature set here for a longer period of time and switches it back on only when the outdoor temperature is **below** the value set here for a longer period of time.

S/W switchover via 2 methods

- By pressing button on heating circuit module HKM (Fig. 2)
- With automatic S/W switchover via outdoor temperature.

When operated with the room control module RRG, this module takes over automatic S/W switchover for the appropriate heating circuits (see RRG).
When operated with the heating circuit module HKM and other EUROCONTROL controllers, the automatic S/W switchover feature (param. No. 516) is effective.

Shutting off switchover!

The automatic S/W switchover feature operates with a switching difference of ± 1 K. If a temperature of equal to or greater than 30 °C is set, in program No. 516, switchover **is not** accomplished!

520 (dTrAbsenk)
Reduction of room temperature setting

The room temperature setting is reduced by the value set here by a connected timer (e.g. EMS) in reduced/night mode. Adjustment range 0 to 10 K.
The room temperature setting made here is included in calculating the boiler temperature setting when outdoor temperature control is used.

532 (Sth1) bzw. 533 (Sth2)
Heating curve steepness HC 1 or 2

When used without room control module RRG, the steepness of the heating curves can be set here for the pump (HC 1) or mixer heating circuit (HC 2)
Note: When used with RRG, the heating curves in the RRG are effective and can be set there!

Standard value for heating curve (delivery state)

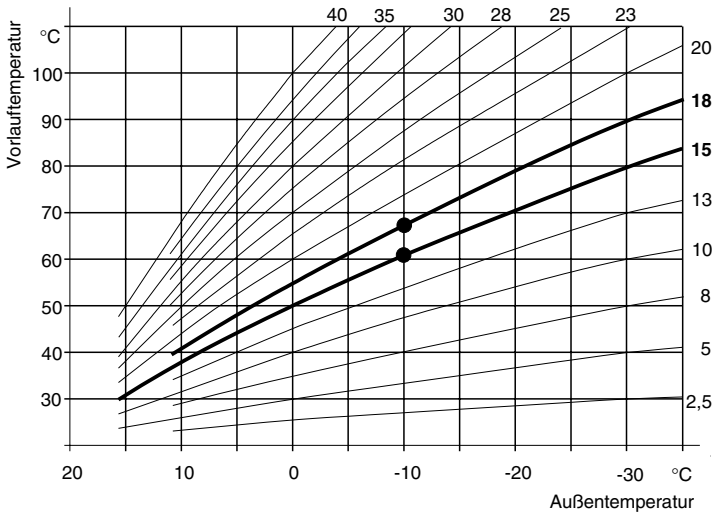
The settings at the heating engineer level for the BMU control centre can be made with the room control module RRG offered in the form of room control module and service module. In this case, the room control module RRG serves as a programming device for the BMU heating engineer level.
The parameters which can be set, are shown in Table 7.
The factory settings for the heating curve as follows:
- Pump heating circuit 25 and
- Mixer heating circuit 25 (Fig. 8)

The heating curves can be adjusted as following, depending on the system equipment:
- with room control module RRG: On heating engineer level for RRG program No.70 or 80. The values from the RRG write over parameters "532" and "533"!
- with heating circuit module HKM: On boiler module parameter "P 5" (table 6) or
- with RRG as service module (param. “532“ and “533“, see table 7).

534 (DtR1) und 535 (DtR2)
Correction of room temperature setting HC 1 and 2

These two parameters shift the heating curve for heating circuit 1 and 2 parallel:
If the room temperature setting is not achieved with the heating curve set, this allows adaptation.

Fig. 8 Heating curves diagram



542 (PminHuwKw)
Min. boiler input in kW

Differ depending on type of boiler: see table 8

543 (PmaxHuwKw)
Max. boiler input in kW

Differ depending on type of boiler: see table 8

Tab. 8 Boiler input in heating mode

Model **EUROCONDENSE PLUS**		**90**	**120**	**160**	**200**	**250**
Prog.-Nr. 536 (NhzMax)	U/min	4600	4950	4700	5100	6000
Prog.-Nr. 541 (PhzMax)	%	70	86	65	71	100
Prog.-Nr. 542 (PminHuKw)	kW	32,0	42,0	56,0	70,0	87,5
Prog.-Nr. 543 (PmaxHuKw)	kW	90,0	120,0	160,0	200,0	250,0

545 (ZBreMinP)
Minimum pause time for burner

Programs No. 542 and 543 serve only for indication of the specific boiler output (no function) and balancing the output when the cascade controller EUROCONTROL BCA 2 is used!

547 (ZReglVerz)
Delay after burner startup

The EUROCONDENSE PLUS is provided with a minimum pause time or startup disable of 3 min. to reduce the number of burner startups.

The controller delay time after burner startup is set to 60 sec. This should **not be readjusted** to ensure reliable burner operation!
During this time, the EUROCONDENSE PLUS is operated at the boiler output set in program No. 598 (LmodRgVerz) (Fig. 9).

551 (Kon)
Constant for rapid reduction (without room influence)

This function switches off the heating circuit pump when the system is switched over to a lower room temperature setting (e.g. night setback reduction). This function is provided for systems operated with outdoor temperature sensor or without room control module.
The switch-off time for the heating circuit pump is set as specified in Table 9 by entering a constant (Kon).
The heating circuit pump is switched off for a maximum of 15 hours.
At outdoor temperatures below –5 °C, the pump is not switched off.
Note: Low "constant" for "lightweight" buildings which cool down quickly
High "constant" for "heavy", well-insulated buildings.

Table 9 Switch off times

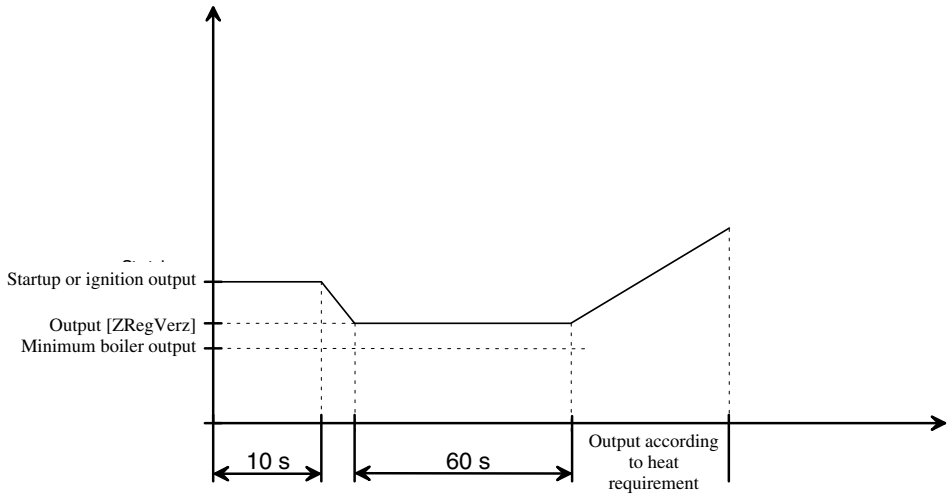
Mixed outdoor temperature	Pump switch-off times in hours (h) for program No. 551 (Kon) = Kon=0	**Kon=4**	Kon=8	Kon=12	Kon=15
-20°C	0	0	0	0	0
-10°C	0	0,5	~ 1h	~ 1,5h	~ 2h
0°C	0	~ 3h	~ 6h	~ 9h	~ 11h
+10	0	~ 5h	~ 11h	~ 15h	~ 15h

552 (HydrSystem)
Hydraulic system setting

The hydraulic system is set to "2" at the factory; i.e. the EUROCONDENSE PLUS can be used for the max: possible number of hydraulic systems. **However, in order to ensure optimum heating operation for application examples 1 through 8 (without unnecessary increases in boiler temperature), program No. 552 should be set accordingly:**

FUNCTION SEQUENCE FOLLOWING BURNER STARTUP

Fig. 9 Function sequence following burner startup for heating operation



Various options for adjustment codes

The various options described below can be set by setting the various bits in program Nos. 555, 558 and 561 (KonfigReg 1, 4 and 7).
Note: Program Nos. 556 and 557 (KonfigRg 2 and 3) should not be adjusted!

Example (e.g. Program No. 555):

00110100 ==> 0 0 1 1 0 1 0 0
Bit 7 Bit 6 Bit 5 Bit 4 Bit 3 Bit 2 Bit 1 Bit 0

Display on room control module RRG:
555. 0 On (or Off)

Whereby the number following the decimal point indicates the bit (here bit 0) and the value 1 or 0 is indicated by the designation "On" or "Off"!

555 (KonfigRg1)

Bit setting for hot-water priority

555.0 *Off*: Absolute priority (factory setting)
555.0 *On*: Sliding priority
555.1 *On*: No priority (parallel operation)

Depending upon the setting, the heating circuit is limited while hot water is heated:
At the factory, absolute priority is set for the pump heating circuit. When sliding priority is set and the heating capacity of the EUROCONDENSE PLUS is not sufficient, the heating circuit is limited accordingly until the hot water is heated up. Parallel operation is possible, however, not recommended: This setting applies for all heating circuits:

Bit setting for terminal assignment N5:

555.2 *Off*: Room thermostat (factory setting)
555.2 *On*: Timer

Factory setting: room thermostat: The switching state of the room thermostat contact is decisive for the heat demand. When the contact is open, the heat demand is inhibited, when the contact is closed, the heat demand from the room temperature thermostat acts on the EUROCONDENSE PLUS. The pump is switched on and off according to the heat demand (with switch-off delay).
If N5 is set to the timer function, in the reduced mode (timer contact open), the room temperature setting is reduced by the value set in param. No. 520 (dTrAbsenk) by 10 K (factory setting). The pump runs in standard mode and in reduced mode except for rapid reduction.
Note: When param. No. 520, code = 0, the heating mode is switched off completely when the timer contact is open!

Table 10 Assignment of HKM or RRG to the heating circuit (program No. 553; KonfigHks)

Setting (e.g. RT setting HK1 (CTC)	HK2 (VTC)	Program No 553	Function Effect of HKM or RRG on HC 1 and HC 2
HKM (plus EMS or. RT)		0	- HKM controls heating circuit 1 (HC 1 of EUROCONDENSE EC)
RRG	HKM (plus EMS or. RT)	1	- RRG (heating curve 1 and TP 1) controls HC 1 (CTC) - HKM (heating curve 2 of EUROCONDENSE PLUS 2) controls HC 2 (VTC)
RRG	HKM (plus EMS or. RT)	2	- RRG (heating curve 1 and TP 2) controls HC 1 (CTC) - HKM (heating curve 1 of EUROCONDENSE PLUS) controls HC 2 (VTC)
HKM (plus EMS or. RT)	**RRG**	**10**	**- HKM (heating curve 1 of EUROCONDENSE PLUS) controls HC 1 (VTC)** **- RRG (heating curve 1 and TP 1) controls HC 2 (CTC)**
RRG	RRG	11	- RRG (heating curve 1 and TP 1) controls HC 1 and HC 2
RRG	RRG	12	- RRG (heating curve 2 and TP 1) controls HC 1 (CTC) - RRG (heating curve 1 and TP 1) controls HC 2 (VTC)
HKM (plus EMS or. RT)	RRG	20	- HKM (heating curve 1 of PEUROCONDENSE PLUS 2) controls HC 1 (CTC) - RRG (heating curve 2 and TP 2) controls HC 2 (VTC)
RRG	**RRG**	**21 Factory setting**	**- RRG (heating curve 1 and TP 1) controls HC 1 (CTC)** **- RRG (heating curve 2 and TP 2) controls HC 2 (VTC)**
RRG	RRG	22	- RRG (heating curve 2 and TP 2) controls HC 1 and HC 2

Key: HKM = Heating circuit module; RRG = Room control module; RT = Room thermostat; CTC = constant temp. circuit;
VTC = variable temperature circuit; TP 1 and 2 = time program 1 or 2 in RRG
Note: If an RRG is not connected, the HKM always controls HC 1

EXPLANATIONS ON ADJUSTEMENT TABLE FOR HEATING ENGINEERS

Bit setting for system frost protection:

555. 4 On: System frost protection On (factory setting)
555. 4 Off: System frost protection OFF
Explanations on frost protection are given on Pages 44/45.
None of the other bit settings should ever be readjusted!

558 (KonfigRg4)
Bit settings for header function:

558.0 Off: Header function OFF (factory setting)
558.0 On: Header function On
When it is necessary for hydraulic reasons, a header pump can be connected (terminal X1; output M5).

Bit setting for type of building

558.1 Off: Lightweight building (factory setting)
558.1 On: Heavy building
The heat storage capacity of the building is taken into consideration beginning on the type of building. With lightweight building, the control reacts more quickly to variations in the outer temperature than for heavy buildings.

Bit setting for selection of connection terminal for hot-water thermostat:

558.2 Off: Hot-water thermostat OFF (factory setting)
558.2 On: Hot-water thermostat ON
With the factor setting, this function is not activated. When a tank control is connected instead of a tank sensor, set bit 2 to 1 (On). This tank control can be connected to terminal X6/B3 instead of the tank sensor B3. The tank control must be equipped with high quality contact material (e.g. gold contact) due to the switching voltage of 5 V DC!
None of the other bit settings should ever be readjusted!

561 (KonfigRg7)
Bit setting for heating circuit pump

561.0 Off: Heating circuit pump in stages (factory setting)
561.0 On: Heating circuit pump modulating

Bit setting for Delta T limit:

561.1 Off: Delta T limit OFF
561.1 On: Delta T limit ON (factory setting)

Bit setting for Delta T control

561.2 Off: Delta T control OFF
561.2 On: Delta T control ON (factory setting)
In program No. 561, it is only permissible to change bits 0, 1 and 2, when then pump function is modified according to the application schematics or the PWM pump is replaced by a stage pump! See also Service note on Page 48.

Bit setting for system volume:

561.3 On and *561.4 Off:* Medium system volume (factory setting)
561.3 Off and *561.4 Off:* Small system volume
561.3 Off and *561.4 On:* Large system volume
A medium system volume corresponds to that for a single family house.
Small system volume corresponds to that for a flat heater.
Larger system volume correspond to that of a multiple family house.

Bit setting for Delta T control in reduced mode:

561.5 Off: Delta T control in reduced mode OFF (factory setting)
561.5 On: Delta T control in reduced mode ON
When bit 5 = 0, the pump is generally operated at the minimum pump speed setting program No. 538 (NqmodMin) in the reduced mode.
When the heat requirement is too low in poorly insulated buildings, this function should be activated (bit 5 =1) so that the pump can operate in the same manner as in the standard mode!
None of the other bit settings should ever be readjusted!

598 (LmodRgVerz)
Output during controller delay time

In program No. 598 (LmodRgVerz), the burner output can be set at which the EUROCONDENSE PLUS operates during the delay time set in program No. 547 (ZreglVerz).
This output must **never be changed!**

604 (LPBKonfig0)
605 (LPBAdrGerNr)
606 (LPBAdrSegNr)

Parameters 604, 605 and 606 are required only for the EUROCONDENSE PLUS in combination with zone controllers, series EC ZR 1/2.
On the EUROCONDENSE PLUS the following settings are always required:
- LPB equipment address 605 (PBADRGerNr), Code = 1 and
- LPB segment address 606 (LPBAdrSegNr), Code = 0.

Adjustment via bus module CIB

This setting can be made according to the instructions for the CIB bus module.

Special function, modem function or door veil (air heater) function
614 (KonfigEingang)
Programmable input F2
(low voltage)

Input F2 can be programmed for the special functions modem function (e.g. remote telephone switch) or door veil function.
Only one function can be used for input F2 in each case!
A floating contact suitable for low voltage is required for actuation of input F2! To prevent contact problems, we recommend installation of the HTS 2 module in between (see HTS 2 instructions).
Code 0 = Standard (factory setting)
No effect
Code 1 = Modem function (e.g. remote control telephone switch) The heating system can be switched off or switched to the stand-by mode centrally when a remote control telephone switch is connected. All protective functions (e.g. frost protection, pump kicks etc.) remain active. The heating requirements from external heating controls (e.g. ZR EC 1/2 or EC MSR) are also inhibited.
Note: The modem function is active when the contact is closed!
Code 2 = Modem function "negative logic"See Code 1 for Function.
Note: The modem function is active when the contact is open!
Code 3 = Door veil (air heater). In this setting, the boiler temperature setting is set to the max: setting (TkSmax) as well as a heat requirement for heating circuit 1. This function is independent of summer and winter mode. Modulation of the burner output and hot water priority remain unchanged. The door veil function can be activated with the HTS 2 (optional extra) on the EUROCONDENSE PLUS heating circuit pump. Relay closed: EUROCONDENSE PLUS is heated up to max. boiler temperature. Relay open: EUROCONDENSE PLUS is held at temperature according to heating curve. See HTS 2 instructions for connection.

Special function output M5, (programmable output)
- Program No. 615 (KonfigAusgang)
(Code 0 to 12)
- Program No. 558 (primary pump)
(see Page 41)

Only one function of output M5 can be used in each case!
Code 0 = Standard (no function)
Code 1 = Message output (e.g. for sub-terrain LPG systems).
This output serves for control of an additional gas valve for operation with LPG. When heat is required from the EUROCONDENSE PLUS the signal output is actuated by the BMU.
The signal output is not relevant for safety and is therefore not monitored. If a fault is present, the signal output is switched off.
Code 2 = Alarm output (external fault signal): Factory setting on EUROCONDENSE PLUS. If a fault is indicated, manual reset is required. The alarm output is set in case of a fault.
Code 3 = Operation message
The EUROCONDENSE PLUS burner mode is displayed.
Code 4 = External transformer (transformer T2): Not available
Code 5 = Exit M5 (Q2Y2)
Pump M2 (Q2) for 2nd pump circuit. See example 3, hydraulic system “34” or example 3b, hydraulic system “35”.

Code 6 = Tank circulation pump M7 (Room control with software > 1.4)
Pump runs according to timer program of romm control.
Code 7 = Door veil function (Air heater)
Pump M8 when door veil function activated
Code 8 = Primary loop pump M6 (see example 1b). Hydraulic system “2” (Parameter 552).
Code 9 = RegC1; Basic function of CIR (relay clip in)
Pump M5 as header pump for hydraulic system “67”. Only active if Parameter 558.0 is “ON”.
Code 10 = Basic function M5 (K2)
Exit M5 according to hydraulic system for header pump M5.
Code 11 = Function not available for EUROCONDENSE EC
Code 12 = Analogue threshold
M5 activated via limits set by the entry of the relay modules, CIST or CISP.

Connect header pump for X1/M5

- Program No. 615; Code 0
- Program No. 558.0, ON

If the hydraulic schematic requires a header pump connect its plug to X1/M5.
Programming header pump function:

1. Set program No. 615 to Code 0
2. Set program No. 558.0 to ON ⇨ Display *"558.0 On"*

Note: Only one of the following functions can be connected: param. No. 558.0, Code = ON or param. No.615, Code 0 to 12!

618 (KonfigEingangR)

● No function: parm. 618 = “0” (Factory-preset)
● Temperature setpoint (param. 618 = “4”)
The temperature setpoint is given by an external analogue signal (0–10 V). The max. setpoint is set at param. 622. The setpoint can be between 5 and 100 °C (limited by the max. boiler temperature of 85 °C).
5 °C is the minimum threshold, i.e. the boiler is switched on at 6 °C and switched off at 4 °C.
The heat demand is valid for HC 1. An additional heat demand (e.g. from a VTC, is accepted, the boiler temperature setpoint is then the maximum of the two heat demands.

● Output setpoint (param. 618 = “5”)
The analogue signal (0–10 V) gives the output setpoint. This analogue signal ist handed over to the boiler control BMU and is interpreted as a percentage value on the specific output range of the boiler. The minimum threshold switching on and off the boiler can be set at param. 623.
The range between min. and max. value ist calculatet into a power signal of 0–100 %.
If the analogue signal is higher than the minimal value, the boiler operates at min. output. At the max. value, the boiler operates at max. output. If the analogue signal is below the minimum threshold, the output setpoint is not active.

Other settings of param. 618 are not possible with the CISP. If other clip in modules are connected, see the specific installation manual for other setting possibilities.

619–621 (KonfigAusgang1R KonfigAusgang3R)

The CISP clip-in has 3 outputs than can be programmed.
Factory-presettings are 619 (output 1) = 2 (alarm signal)
620 (output 2) = 3 (operating signal)
621 (output 3) = 0 (no function)
See wiring diagram for details.

724 (MmiStatus)
Current summer/winter setting for boiler module

The current summer/winter setting for the boiler module is displayed:

724.0 0 or 1:	Current summer/winter setting (Value 0 = Summer, Value 1 = Winter)
724.1 0 or 1:	Current summer/winter switchover (Value 0 = Manual, Value 1 = Automatic)

755 (IonStrom)
Ionization current actual value display

The current ionization current is indicated when the burner is in operation.

CONTROL STRATEGIES

Hot-water control

The hot-water requirement has priority over heat requirement.

Automatic day heat limit

The automatic day heat limit is effective only when the outdoor temperature sensor is connected.
This is a rapid-acting economy function, which switches off the boiler when the mixed outdoor temperature is higher than the room temperature setting (standard or reduced).
The boiler switches back on when the mixed outdoor temperature is 2 K below the room temperature setting.
For outdoor temperature control with room influence, the actual room temperature is taken into consideration.
The automatic day heating limit does not have a direct effect in “continuous operation”.
When the automatic day heating limit is active, "ECO" appears on the display of the room control module RRG.

Rapid heatup

Only possible when room control module RRG is connected and room sensor active. Quick heatup/quick reduction is effective only when the heating circuit is switched over from frost protection or reduced mode to standard operation and the room temperature is simultaneously more than 1.5 °C below the room temperature setting (even when room temperature setting is increased on room control module).
Quick heat up is terminated when the room temperature is less than 0.25 °C below the room temperature setting.

Rapid reduction (with room sensor)

When the heating circuit is switched over from Standard mode to Reduced mode or Frost protection mode, the rapid reduction feature is active (heating circuit pump is switched off).

Boiler frost protection

If the boiler temperature drops below the temperature set for boiler frost protection, the burner and heating circuit pump are started up. When the boiler temperature increases to above the switch-off limit, the burner is switched off, the heating circuit pump continues to run for the pump overrun delay time.

System frost protection

On systems with outdoor temperature sensor, the system frost protection feature is switched on and off by the outdoor temperature. In this case, the heating circuit pump is switched as follows:

Outdoor temperature	Pumps
< 4 °C	Continuous operation pumps ON
- 5 °C bis 1,5 °C	Pumps on for 10 min. every 6 hours
> 1,5 °C	Pumps OFF

Building frost protection

The building is protected against frost in all operating modes:

- Room control module RRG (with effective room sensor): The frost protection room temperature setpoint is effective in all modes.
- Heating circuit module HKM with timer EMS/DSU or room control module RRG (without effective room sensor): The building frost protection is ensured by the heat requirement in the Standard and reduced mode.
- Room thermostat: Building frost protection is ensured by the heat requirement from the room thermostat

Hot-water frost protection

The tank is protected against freezing because the tank is automatically charged when the temperature drops below the setting.

Restart inhibit (burner starts)

To reduce the number of burner startups, the boiler is equipped with a startup inhibit of 3 min.

Anti-legionaires' disease function (only with room control module RRG

Heatup is started once a week on Monday with the first hot-water charge and lasts for a maximum of 2.5 hours. In the "Stand-by" mode, the function is inhibited. If it is inhibited for longer than 1 day, the anti-legionaires' disease function is repeated as soon as the hot water is enabled.

Chimney sweep function

The so-called "Chimney sweep" function can be activated by pressing the Chimney sweep button (12) (> **3 sec.**) (fault indicator (8) **flashes once**). The burner is switched on and heats up the EUROCONDENSE EC at the maximum boiler output until the temperature monitor trips at 82 °C.
Note: "SF" appears on display (13) and the fault indicator (8) flashes!

Deactivation of chimney sweep function

Press the chimney sweep button (12) (**min 1 sec.**) to deactivate the chimney sweep function.

Emergency operation functions

In the event of component failure, an error message is output (see Table 13), leading to startup prevention and emergency operation function, however not to fault switch-off.
Moreover, emergency operation is accomplished in the event of the following faults:

● Hot water mode:

Defective tank sensor: The Hot water mode is inhibited, heating operation for the heating circuit is still ensured.
Defective room control module RRG or heating circuit module HKM: The hot water temperature is regulated to the value set on the boiler module under parameter "P 2".

● Heating mode:

Defective outdoor temperature sensor: In the event of a defective outdoor temperature sensor, the system is regulated to a boiler temperature corresponding to an outdoor temperature of 0 °C.

Fig. 10 Heating circuit module HKM

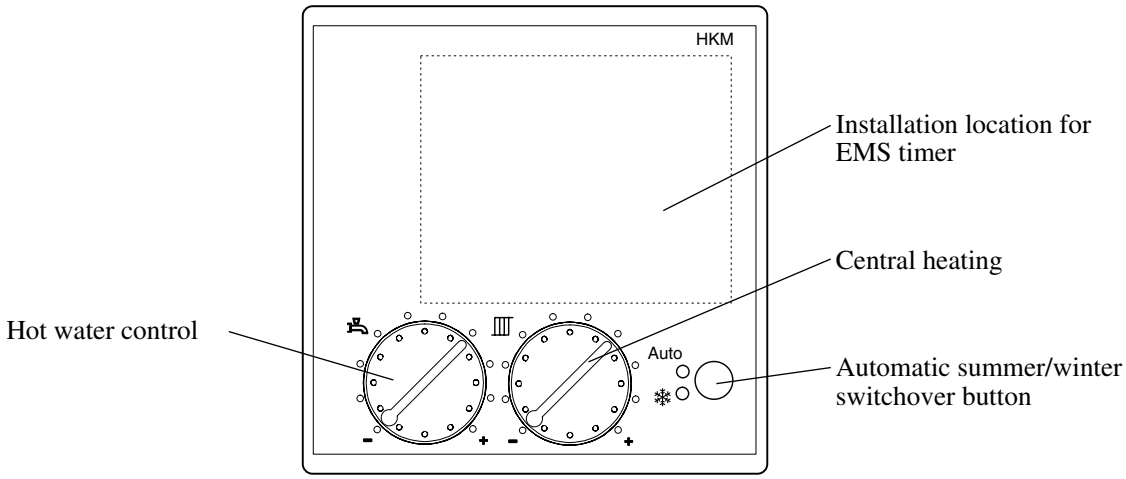
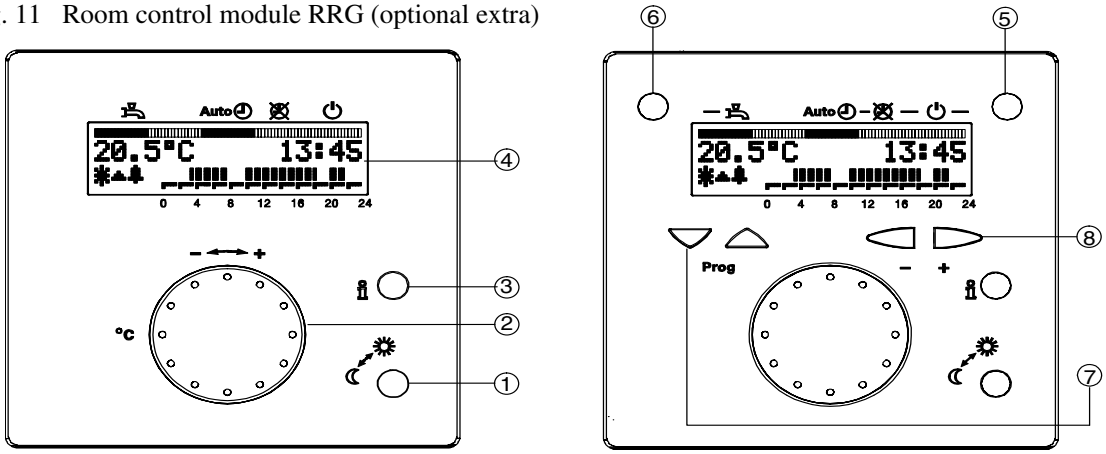


Fig. 11 Room control module RRG (optional extra)



Legend:

③ Presence button	♣ Info button	¶ Mode buttons	⑥ Program buttons
④ Temperature knob	➳ Display field	⑥ Hot water button	⑦ Adjustment buttons

Operating modes:

Mode button		Function
Auto	Automatic operation	Heating function according to heating program Holiday function effective
⊠	Continuous operation	Heating circuit continuous (according to room temperature setting or reduced setting); holiday function *not* active
⏻	Stand-by	Heating circuit switched off Holiday function *not* effective; frost protection functions active

Heating circuit module HKM (Fig. 10) Supplied with the EUROCONDENSE PLUS.

Operation without outdoor temperature sensor
- Boiler temperature setting on heating circuit control
- Hot-water temperature setting on hot-water control

Operation with outdoor temperature sensor
- Room temperature setting on heating circuit control
- Hot-water temperature setting on hot-water control.

Automatic summer/winter switchover

With the automatic Summer/Winter switchover button, it is possible to switch back and forth manually between Summer and Winter and Automatic mode:

Manual summer	Manual winter	Automatic mode
LED "Auto" ❍	LED "Auto" ❍	LED "Auto" ●
LED "❄" ❍	LED "❄" ●	LED "❄" ❍ or ● *)

*) For example the display for winter mode is active

(● = active) depending on the automatic setting.

Room control module RRG (Fig. 11) With the room control module (optional extra), you can
- control the functions from the room (remote control)
- make settings (e.g. your own timer programs)
- call up information (e.g. temperature values) etc.

All possibilities are described in the instructions included with the room control module. Only a few of the most important functions are described below.

Presence button

With the Presence button, you can manually manipulate the set timer program (heating program):
- "Sun" symbol: Heating operates at set temperature.
- "Moon" symbol: Heating operates at reduced temperature.

The Presence button is effective until the timer program switches the next time.
The presence button has no effect on the hot-water heating!

Temperature knob

You can readjust the set temperature with the temperature knob. One increment corresponds to approx. 1 °C. Before changing the temperature setting on the temperature knob, set the thermostatic valves to the desired temperature. Correct again only after the temperature has adapted.

Temperature sensor in room control module

The temperature sensor integrated into the room control module is effective only when the room influence is enabled on the EUROCONDENSE PLUS.

Error messages

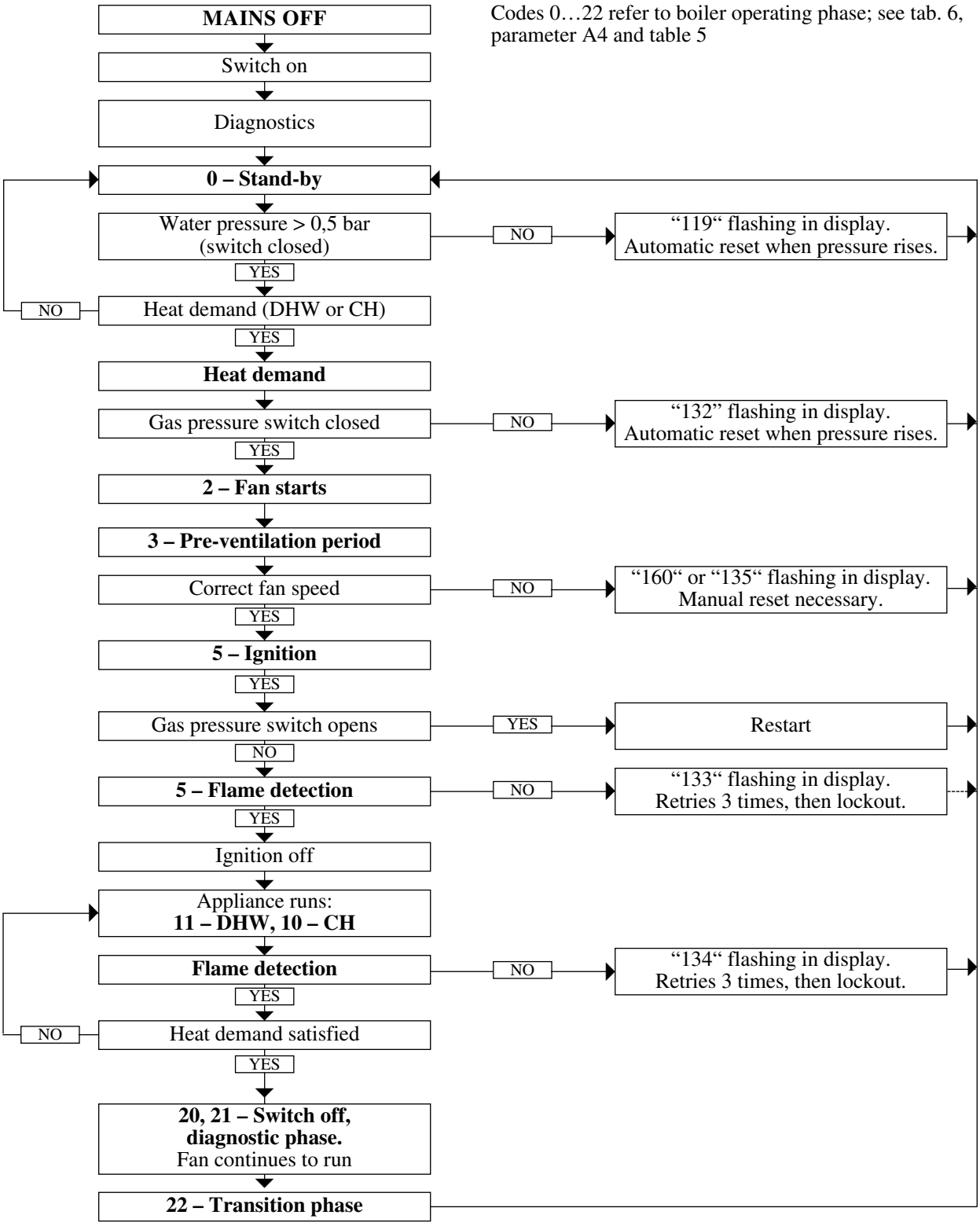
No display: - Faulty connection from room control module to EUROCONDENSE PLUS
- EUROCONDENSE PLUS switched off or no mains
- Room control module defective
- Room control module and EUROCONDENSE PLUS not compatible

Display OFF: - EUROCONDENSE PLUS 2 not set to "Automatic mode"
Display ---: No sensor present or sensor defective

Tab. 11 Technical Data

Model	EUROCONDENSE PLUS		90	120	160	200	250
Product-ID			CE 0085 BN 0577				
Nominal Heat input range (net)	Natural gas	kW	31,5 - 90,0	42,0 - 120,0	56,0 - 160,0	70,0 - 200,0	87,5 - 250,0
Nominal Heat input range (gross)		kW	35,0 - 99,9	46,6 - 133,2	62,2 - 177,6	77,7 - 222,0	97,1 - 277,5
Nominal heat output range	80/60°C	kW	30,5 - 86,7	40,7 - 115,6	54,0 - 153,0	67,2 - 190,2	83,1 - 237,0
	50/30°C	kW	33,2 - 92,3	44,2 - 123,0	59,0 - 163,5	73,6 - 205,0	92,4 - 252,3
Nominal Heat input range (net)	LPG	kW	45,0 - 90,0	60,0 - 120,0	80,0 - 160,0	100,0 - 200,0	125,0 - 250,0
Nominal Heat input range (gross)		kW	48,9 - 97,7	65,2 - 130,3	86,9 - 173,8	108,6 - 217,2	135,8 - 271,5
Nominal Heat output	80/60°C	kW	43,5 - 86,7	58,1 - 115,6	77,1 - 153,0	96,1 - 190,2	120,0 - 237,0
	50/30°C	kW	47,4 - 92,3	63,1 - 123,0	84,3 - 163,5	105,1 - 205,0	130,0 - 252,3
Gas consumption (NG)		ml/hr	9,4	12,5	16,7	20,9	26,1
Gas consumption (LPG)		ml/hr	3,8	5,1	6,8	8,4	10,5
Flue Temperature	80/60°C	°C	67	64	70	73	74
	50/30°C	°C	46	46	48	50	53
Flue Gas Volume (NG) (15°C & 1013 mbar Pressure)		ml/hr	127	169	225	282	352
Nominal Gas Inlet Pressure	NG		20 mbar				
Gas Inlet Pressure	LPG		Min. 25 mbar - max 45 mbar				
CO_2 for Natural Gas		%	8,0 - 8,5				
CO_2 for LPG		%	9,5 - 10,0		9,0 - 9,5		
High Level Natural Ventilation to BS 6644		cmk	360	435	531	635	761
Low Level Natural Ventilation to BS 6644		cmk	720	870	1062	1269	1522
Hydraulic resistance at 11K Dt		kPa	8,5	14,7	11,0	13,1	16,5
Hydraulic resistance at 20K Dt		kPa	2,8	4,8	3,5	4,1	5,1
Water flow at 11K Dt		lit/sec	1,95	2,61	3,47	4,34	5,43
Minimum Water Flow at 20K Dt		lit/sec	1,08	1,43	1,91	2,39	2,99
Cold feed size		mm	25	25	32	32	32
Open vent size		mm	32	32	40	40	40
Max. pressure at boiler flue outlet		mbar	1,0				
Flue spigot size		mm	150	150	180	180	180
Electrical supply		V/Hz	230/50				
Maximum Electrical Power Consumption		W	130	150	175	200	320
Minimum Operating Pressure		bar	0,5				
Maximum Water Pressure		bar	4,0				
Maximum Flow Temperature		°C	100				
Boiler weight		kg	165	190	220	260	305
Boiler water content		lit/sec	12	15	20	23	26
Boiler height		mm	1300	1300	1390	1390	1390
Boiler width		mm	762	910	1150	1150	1250
Boiler depth		mm	764	764	764	764	764

Diagnostic flow chart



Codes 0…22 refer to boiler operating phase; see tab. 6, parameter A4 and table 5

FAULT MESSAGES

Table 12 Fault messages (display 13 flashing)

Display flashing (Code-No.)	Description	Explanations Possible causes and function sequence
10	Outdoor temperature sensor short circuit or discontinuity	Check connection and outdoor temperature sensor
20	Boiler flow sensor short circuit or open circuit	Check connection 2)
40	Boiler return sensor short circuit or open circuit	Check connection 2)
50	Hot-water sensor 1 short circuit or open circuit	Check connection; emergency operation 2)
52	Hot-water sensor 2 short circuit or open circuit	Check connection 2) (not present)
61	Fault, room control module RRG	Check room control module RRG
62	Wrong room control module connected	Connect compatible room control module
81	Short circuit on LPB bus or no bus feed	Check bus
82	Address conflict on LPB bus (EUROCONTROL)	Check addresses of connected control modules
91	EEPROM data loss	Internal BMU error, process sensor, change BMU
92	Hardware error	Internal BMU error, process sensor, change BMU
100	Two time master	Check EUROCONTROL timer master
110	Limit stat tripped	Allow unit to cool down and reset. If fault occurs several times, notify heating engineer 1) temperature stat open circuit (possible short circuit in gas valve) 3)
111	Max. temperature tripped	Not heat requirement, pump defective, radiator valves closed
119	Water pressure switch tripped	Check water pressure and add water if required 2)
132	Safety switch off	e.g. contact F7 or F5 open
133	No flame detected (no flame message after expiration of safety time)	Reset, if fault occurs a number of time, notify heating engineer, insufficient gas (see Page 20), check polarity of line power connection, ignition electrodes and ionization current 1) 2)
134	Flame failure during operation	Automatic restart attempt by PARAMOUNT
135	Incorrect air supply	Fan speed above or below speed threshold 2)
140	Impermissible LPB segment number or equipment number	Check setting on EUROCONTROL
148	Incompatibility between LPB interface/basic unit	Check setting on EUROCONTROL
151	Internal error in BMU	Check parameters (Tables 7 and 8), heating engineer 1) 2)
152	Error in BMU parameter settings	Repeat parameter settings
153	EUROCONDENSE EC PLUS disabled	Press reset button 1)
154	Temperature fault	Parameter incorrectly set (Tables 7 and 8), check parameters 1) 3) or boiler temperature too high
160	Fan speed error	Fan speed not reached 1)
161	Max. speed exceeded	Max. fan speed exceeded
180	Chimney sweep function active	4)
181	Controller stop mode active	4)
183	EUROCONDENSE EC PLUS in programming mode	1)

Display of 3-digit error messages: The 1 in the number 100 is displayed alternately with the 10's position.

1) Switch off and disable; can be enabled only with Reset

2) Switch off, start prevention; starts backup after fault disappears

3) Check parameters according to Table 7 and program basic settings or check value "b 0" (internal BMU-SW diagnostic code, Table 6) and correct parameter error according to error specification!

4) Error display only, no switch off

For further details on Potterton Commercial boiler products contact the following:

COMMERCIAL SALES &: TECHNICAL ENQUIRIES	Potterton Commercial Product Division Brook House, Coventry Road, WARWICK, CV34 4LL Tel: (08706) 050607 Fax: (012928) 880612
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COMMERCIAL SERVICE OFFICES	Our service organisation cobers the whole U.K. to look after your needs for all Potterton Commercial Products. We ar also able to offer our services for other manufacturers products.
SOUTHERN REGION	Potterton Commercial Service Dept Unit 2 Borehamwood Enterprise Centre Theobald Street, BOREHAMWOOD, Herts WD6 4 RU Tel: (08702) 412759 Fax: (02082) 072466
NORTHERN REGION	Potterton Commercial Service Dept Unit 102, Batley Enterprise Centre, 513 Bradford Road, BATLEY, West Yorkshire WF17 8JY Tel: (01924) 412759 Fax: (01924) 420276 Our service offices offer a wide range of specialised services including: ● Boiler Site Assembly ● Burner Commissioning for all Fuels ● Boiler Maintenance & Maintenance Contracts ● Breakdown & Repair Services ● Boiler Dismantling & Re-Jointing ● Burner & Boiler Replacement ● Oil/Gas Conversions ● System Conditioning ● Water Treatment & Descaling ● Packaged Units
SPARES	Potterton Commercial spares are available nationwide through the Potterton Interpart network. Alternatively please contact: Potterton Myson Parts & Distribution Centre, Brooks House, Coventry Road, WARWICK, Warwickshire CV 34 4LL Tel: (01926) 880600 Fax: (01926) 880680 or Curzon Compenents National Spares Hotline Tel: (0990) 103030

All descriptions and illustrations contained in this leaflet have been carefully prepared but we reserve the right to make changes and improvements in our products which may affect the accuracy of the information contained in this leaflet.

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